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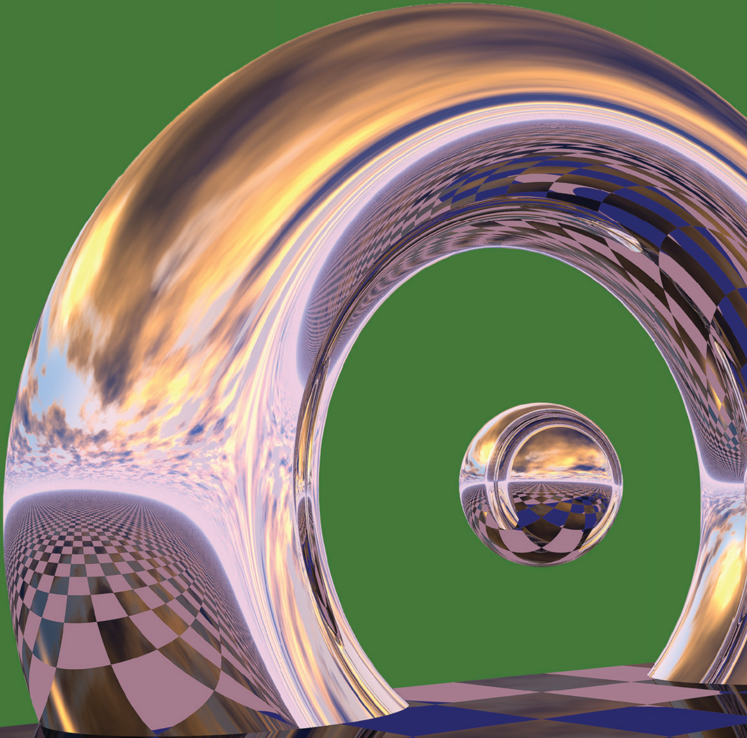
Course Guidebook

Professor David Kyle Johnson
King's College



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Professor David Kyle Johnson is an Associate Professor of Philosophy at King's College in Wilkes-Barre, Pennsylvania. After receiving his bachelor's degree in Religion and Philosophy at Southern Nazarene University in 2000, he completed his master's and doctor of philosophy degrees at the University of Oklahoma and developed specializations and competencies in philosophy of religion, metaphysics, logic, epistemology, and philosophy of science. While in graduate school, he won the coveted Kenneth Merrill Graduate Teaching Award.

Professor Johnson wrote his dissertation on the divine foreknowledge and human freedom dilemma, a topic that delved heavily into the nature of free will, time, and the consequences of Einstein's relativity. His first major publication rearticulated these arguments in the journal *Religious Studies*. Since then, he has published on the problem of natural evil, its relation to Nick Bostrom's simulation argument, skeptical theism, the multiverse hypothesis, the existence of souls, and the paradox of fiction in such journals as *Sophia*, *Philo*, *Philosophy and Literature*, and *Think*.

Professor Johnson regularly teaches classes on metaphysics, philosophy of religion, philosophy of mind, and logic, as well as a liberal arts seminar that focuses on teaching critical thinking and scientific reasoning. He also ventures outside philosophy, teaching a world religion class and an introduction to science class. In addition, he sponsors his school's philosophy club, the Socratic Society.

Professor Johnson presents regularly at the Eastern Pennsylvania Philosophical Association conferences and has participated in several other conferences. At the sixth annual Lighthearted Philosophers' Society conference, he and Dr. Ruth Tallman won the award for best paper for "A Debate between a Theist and a Santa Clausist." Currently, Professor Johnson is working on papers regarding the conflict of science and religion, miracles, and religious experience and is pursuing a personal interest by writing a book on Christmas. In 2011, he won the American Philosophical Association's Public Philosophy Op-Ed Contest for his piece "Watson in Philosophical Jeopardy?"

Professor Johnson publishes quite prolifically on the intersection of pop culture and philosophy. He has edited or coedited three books on the topic: *Inception and Philosophy: Because It's Never Just a Dream*; *Heroes and Philosophy: Buy the Book, Save the World*; and *Introducing Philosophy through Pop Culture: From Socrates to South Park, Hume to House.* He also has written numerous articles for pop culture books that explore the relationship between philosophical questions and such cultural phenomena as *The Daily Show*, Stephen Colbert, *The Hobbit*, *Doctor Who*, Batman, *South Park*, *Family Guy*, *The Onion*, *The Office*, Johnny Cash, *Battlestar Galactica*, Quentin Tarantino, and Christmas. Professor Johnson appeared on a special episode of Massimo Pigliucci's podcast *Rationally Speaking* recorded live at the Northeast Conference on Science and Skepticism (NECSS). For the Authors@Google series, he gave a talk on his book *Inception and Philosophy*. He also maintains two blogs for *Psychology Today*: *A Logical Take* and one with William Irwin on the intersection of philosophy and pop culture, *Plato on Pop*. ■

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Exploring Metaphysics

Scope:

Despite what you might find in the metaphysics section of your favorite bookstore, in philosophy, metaphysics is the study of reality. Originally, the word "metaphysics" referred to the works of Aristotle that you were supposed to read after his works on physics; in Aristotle's *Metaphysics*, he talks about being and first causes. But now, the word refers to philosophical investigations regarding the nature of reality, including the nature of human beings, and the things that may lie beyond reality. The existence of God is obviously a metaphysical topic, but so are the essence of people and the nature of the human mind. And then there are questions about human free will. Can we really choose our destiny, or is everything that happens fated to happen?

But metaphysicians don't always have their heads in the clouds. The nature of the universe itself, and the matter that makes it up, are also of prime importance to the metaphysician. Consequently, science will greatly inform our metaphysical investigations. Einstein's general and special theories of relativity, along with quantum mechanics, reveal some very interesting things about the nature of the universe.

And then there are questions that seem to be about both the universe itself and what's beyond it—for example, are there other universes? Is the reality we live in actually a multiverse? This may be true for multiple reasons, not the least of which is the notion that it's much more likely than you think that we live in a computer simulation.

The first half of the course will concentrate on human beings. The course will begin by examining the nature of the human mind. We know it is related to the human brain, but how? Can the mind exist without the brain? How does the brain produce the mind? The course will then explore the essence of people. You are supposedly the same person over time; you now and your eight-year-old self are one and the same. But in virtue of what is this true?

Your soul? Your memories? Having the same body? Exploring this question may reveal that people are nothing like you previously conceived; in fact, they may not exist at all. Unexpectedly, this will lead into a quick discussion about the nature of time, and then to exploring reasons that humans may not have free will. But ultimately, it all may be in vain—we may not be free to believe that we're not free.

The second half of the course will explore the nature of the universe and what may lie beyond it. This part of the course will begin with a quick primer on heavy metaphysical notions such as universals, particulars, and possible worlds. Then, the course will address the existence of God. What are people talking about when they talk about God? A perfect being? Is the concept of a perfect being even logically consistent? Might God's mere definition entail that he or she exists? Does the existence of the universe point to the existence of a deity? How about the universe's design? The course will explore these arguments in detail, identifying both their strengths and their weaknesses.

The course will then explore the nature of the universe. First, you will learn about the basics of Einstein's general and special theories of relativity, which suggest that the fabric of the universe—what Einstein called space-time—can be warped by massive objects. But is space-time really a substance in which matter rests, or is all that exists objects and relations between them? Similarly, what is time? Is it just a measure of change, or is it a substance through which objects move? And if it is a substance, can we alter the way we move through it? Is time travel possible?

Next, you will learn about the discoveries of quantum mechanics to explore the nature of physical matter itself. You will discover that if you think you understand quantum mechanics, you probably don't. But what you learn will force you to consider the possibility that there is more than one universe, and you will discover that quantum mechanics is not the only thing that suggests as much. In the conclusion of the course, you will discover that it is much more likely than you think that we live in a computer simulation.

Philosophy is one of the few disciplines where you can end up being less certain of things than when you began. In metaphysics, you can embrace answers if you're willing to accept the consequences, but the best approach may be to embrace the confusion—to simply seek an understanding of how difficult metaphysical issues are and realize that true wisdom is found in admitting ignorance. ■

How to Explore Metaphysics

Lecture 1

Metaphysics is the study of the fundamental nature of reality—the nature of the physical world itself and what might exist beyond it. Science informs metaphysical inquiry, and metaphysical questions are often about the discoveries and theories of science. We do metaphysics by examining our most fundamental assumptions about the way the world is, being open to the fact that we might be wrong and to changing our mind if we are. In addition, although it might be frustrating to study metaphysics because we so seldom get concrete answers, true wisdom can be found in understanding the problems and shortcomings of the proposed solutions and in admitting our own ignorance.

Metaphysics and Science

- Metaphysics is the study of the fundamental nature of reality. It often concerns itself with things beyond the physical world, and persons and minds are often thought to be such things. And if God exists, at least as many conceive of him or her, he or she exists beyond the physical world—so, questions about God's existence are metaphysical questions as well.

- But metaphysicians are also concerned with the nature of the physical world itself. In fact, science is relevant to metaphysics in a number of ways. Not only do scientific theories like quantum mechanics raise interesting questions to ponder, but discoveries in neuroscience will also shed light on the philosophical problems surrounding the human mind. And what can be explained and what can't be explained in physics may be relevant to whether or not God exists.

- Science is a method for discovering the truth about the way the world is—our most reliable method. It does so by formulating conflicting hypotheses, deriving predictions based on those hypotheses, and then seeing which hypothesis is most fruitful—that is, which hypothesis correctly predicts what happens in the physical world. Scientists will also favor a hypothesis if it has wide scope—that is, if it has explanatory power. They will favor it if it is simple (it doesn't require numerous assumptions or entities) and if it is conservative (if it doesn't conflict with things that we already know to be true).

- Like metaphysics, science is also a branch of philosophy. Science was originally called natural philosophy and became its own discipline when certain philosophers became concerned enough with certain problems, developed ways of studying them, and discovered definitive answers to those questions. This new knowledge opened up whole new avenues of research, and a new discipline was born.

- This is why philosophy has an inaccurate reputation as a discipline that simply spends its time trying to answer unanswerable questions. Philosophy in fact has answered many questions; it's just that the answers it has discovered are so important that they give rise to the existence of their own disciplines, leaving philosophy and the philosophers that don't enter that discipline with the rest of the questions that have yet to be answered.

- We need metaphysics today because although science can get us very interesting measurements and results and produce interesting and fruitful theories, it can't always identify the conceptual or philosophical problems that are raised by those results or that might exist in those theories. Sometimes we need metaphysics for that. Unfortunately, some scientists are hostile toward metaphysics, but good scientists recognize the need for it.

How Do We Do Metaphysics?

- To do metaphysics, we have to realize that even our most basic, fundamental, and cherished assumptions might be wrong. Our fundamental and cherished assumptions are the assumptions that we are least likely to examine on our own, so it shouldn't be too surprising that we would turn out to be wrong about something we haven’t thought that much about.

- In doing metaphysics, when you realize that you’ve been wrong, you have to be willing to admit it and change your mind—otherwise, what’s the point? If you’re going to think long and hard about something to discover the truth, what good does it do you if you won’t embrace the truth once you’ve found it?

- There are also a few important lessons to keep in mind regarding how to do metaphysics. First, you have to understand the importance and the point of a thought experiment. When doing metaphysics, we will often consider hypothetical scenarios that are sometimes rather ridiculous—that could never happen or at least will likely never happen in your lifetime. Thought experiments expose your intuitions and reveal your beliefs about certain topics; the fact that they would never happen is irrelevant.

- When doing metaphysics, we must also realize that if an argument that supports a particular conclusion fails, that doesn’t mean that the conclusion is false—it just means that the argument doesn’t establish its conclusion. This doesn’t mean that you can be justified in believing whatever you want, but just keep in mind that one bad argument toward a conclusion doesn’t necessarily mean that the conclusion is false.

- Metaphysics can be a little frustrating. Because we are dealing with questions that can’t be answered scientifically—at least not yet—we are going to find very few definitive answers. We will discover and discuss a number of possible answers and theories, but most, if not all, of them will be subject to very serious objections. This can be a bit discouraging; you will wonder where the truth lies. But there are a few things to keep in mind that can alleviate such worries.

- First, you should realize that this is a problem dealt with in all philosophy. Once philosophical pondering results in definitive real-world answers, those answers spawn a new discipline—science,

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Metaphysics is a branch of philosophy that includes the study of the mind.

math, theology, law, or another—leaving philosophers to deal with the remaining questions that have yet to be answered.

- In participating in metaphysics, and in philosophy in general, you are participating in a centuries-long pursuit of truth—one that has led to just about every major leap forward in human progress. We are on the frontier of human discovery, so we should be able to find satisfaction even in searching for answers that currently elude us.

- Metaphysics can seem frustrating because it might seem that answers to metaphysical questions are unattainable, but many of the answers that we take for granted today were considered by the ancients to be unattainable: What causes the seasons? What is the Sun? What causes the weather? These were questions that seemed so unanswerable that the ancients simply invented myths to explain them. Whether or not the ancients took such stories literally, they would've likely thought that pondering about what truly causes the seasons would be fruitless—as fruitless as ponderings about free will, the mind, and God seem to some today. But it would be premature to quit before we even try.

Assumptions and Questions

- When it comes to unanswered metaphysical questions, something else that might feed our frustration is a faulty assumption about how many questions other disciplines answer. Metaphysics is not unique in being unable to give us ultimate answers to fundamental questions.

- For example, although mathematics seems to give us very concrete knowledge, it's not that concrete at all. All mathematical systems are based on axioms—unproven, unprovable assumptions. Mathematics is the process of discovering what follows from those assumptions. But it's not like we know that those assumptions are true. We just assume they are and work from there. But different assumptions will entail different things and produce different mathematical systems, and there is no way to use mathematics itself to discover which, if any, of the systems actually describe the way the world is.

- Another discipline that may seem concrete, but isn't, is science. First, all reasoning in science is inductive: It uses a method of reasoning where an argument's premises don't guarantee its conclusion, but only make the conclusion likely. So, almost nothing in science is ever proven 100 percent; there is always the possibility that even the most highly confirmed theory could turn out to be false.

- In addition, there are multiple interpretations of many scientific findings and theories. Some have even argued that scientific theories, especially those that cannot be observationally confirmed, are merely instrumentally true. They are useful ways to describe the world, but they do not actually describe the way the world is.

- Lastly, it's not clear how much explaining science actually does. In addition, scientific explanations can only go so far; eventually, you get down to something that is a "brute fact." It just is the way it is for no other reason than it is that way. And even if we do one day explain something that was once thought to be a brute fact, we will do so by simply appealing to a deeper brute fact. There will always be something that is left unexplained; no scientific explanation will ever be ultimate.

- This is not a knock against science—for the same reasons, no field of study will ever give us an ultimate explanation. Explanations will always bottom out in some brute fact, and where science bottoms out is pretty deep down. The fact that metaphysics does not give us ultimate, concrete answers and explanations does not make it different from other disciplines.

- We can also find comfort in the fact that we can find and embrace answers to metaphysical questions—it's just that the study of metaphysics will reveal the consequences of the answers that we wish to embrace. You can adopt an answer to a metaphysical question; you will just have to decide whether the consequences of embracing that answer are palatable. Does that answer commit you to things you are not willing to accept as true?

- The goal of metaphysics is not necessarily definitive knowledge, but understanding—an understanding of the true nature and depth of some of the most important problems and questions that we can ask as human beings. True wisdom might be found not in answering these questions, but in understanding and appreciating the difficulty of these questions and the difficulties that surround the possible answers to them.

Suggested Reading

Aronofsky, *Pi.*

Benacerraf and Putnam, *Philosophy of Mathematics*.

Carter, *Mapping the Mind*, Chap. 2.

Dunning, "The Golden Ratio."

Egan, "Both Sides Now."

Gazzaniga, "Forty-Five Years of Split-Brain Research and Still Going Strong."

Loux, *Metaphysics*.

Plato, *The Apology.*

Resnik, *Mathematics as a Science of Patterns.*

Rosenberg, *Philosophy of Science*.

Schick and Vaughn, *Doing Philosophy*.

———, *How to Think about Weird Things*.

Sperry, "Hemisphere Deconnection and Unity in Conscious Awareness."

Taylor, *Metaphysics*.

Van Inwagen, *Metaphysics*.

Zimmerman, *Oxford Studies in Metaphysics*.

Questions to Consider

1. How would you define the difference between science and metaphysics?

2. Which is the better approach to studying metaphysics: to find and settle on an answer to difficult questions or to understand and appreciate the difficulty of the questions? Or are there other approaches?

The Mystery of the Mind and the Soul

Lecture 2

The mind may be a terrible thing to waste, but it is also an extremely difficult thing to understand. The problems surrounding minds and their relation to brains are some of the most perplexing problems in all of metaphysics. This lecture will define these problems, and you will learn about why the most common and supposedly easiest answers to these questions fall short. The easy answer to the metaphysical questions of the mind—that souls exist—is a very problematic answer, and therefore, it is certainly worth considering other possible theories.

Defining Terms and Problems

- The terms "mind" and "brain" are often used interchangeably. This equivocation happens because of the known close relationship between the mind and brain. In metaphysics, the word "brain" is reserved for the physical organ—made up of neurons, gray and white matter, axons and neurotransmitters, and glands—that sits atop your spinal column. The word "mind" is reserved for what contains, or is, your mental life—your visual experiences, beliefs, decisions, personality, wants and desires, and emotions. These are mental things and, thus, constitute your mind.

- One of the biggest questions in metaphysics is about the relationship between our minds and our brains. Philosophers call it the hard problem of consciousness because many think that it is unsolvable. The question essentially is this: How does the activity of the brain produce mental phenomena? It seems clear that there is a direct relation between brain activity and mental activity, but what exactly is that relationship? More precisely, how is it that the activity of the brain can produce mental phenomena?

- Although the brain also is composed of chemicals and glands, it is neurons that contain and process all the information. It is because the neurons are firing in a certain kind of way that you have, for example, a certain visual experience. But how do neurons produce mental experiences like visual experiences? And why does one collection of neurons firing a certain way produce a visual experience but another set of neurons firing in a different way produce an auditory sensation, or a belief, or a desire?

- Ultimately, mental experiences and brain events seem to be two totally different kinds of things. Brain events, the firing of neurons, have a location in time and space. Your beliefs and desires do not. The mind seems to be unlike anything in nature—so what is it? And what is its relationship to the brain? Could it be the same thing as the brain? If not, can the mind exist without the brain?

- When considering these questions for the first time, most people think that the soul hypothesis—the idea that humans have souls—holds the obvious and easy answer. However, and this is common in metaphysics, the obvious, easy answer is inadequate. Fortunately, finding out why will send us down a path of discovery that leads to many more possible answers.

- But first, we have to understand what philosophers are talking about when they talk about the soul. They're not talking about someone's personality, inner drive, or emotions. The human soul, as it is classically conceived, is something nonphysical. That is why it can have, or at least contain, things that have properties that no physical thing can have. Your soul is where your visual experiences occur, your personality is housed, your beliefs are had, your emotions are felt—basically, any mental activity that occurs, occurs "in" the soul. And because the soul is a nonphysical entity, it is not reliant upon the body for existence. The soul can exist without the body.

- Consequently, the soul hypothesis is often coupled with the notion that our soul floats away from our bodies when we die. Some believe that it becomes a ghost; others believe that it enters heaven. Basically, the idea is that your mind is a separable entity, made of a nonphysical substance, containing all of your mentality.

- It's important to realize that if the soul hypothesis turns out to be false, and the mind is not that kind of thing—that mental activity is not contained in a nonphysical separable substance—that doesn't mean that minds don't exist. It just means that minds aren't the kind of thing that the soul hypothesis suggests they are. And, although most philosophers today doubt the existence of souls, very few doubt the existence of minds.

Why Souls Don't Exist

- Initially, you might wonder why the existence of the soul even needs an argument. But while introspection does reveal the existence of one's mind—it seems that there is not anything that you can be more certain of than the fact that you're having experiences right now—your introspection does not reveal that those experiences are housed in a nonphysical substance that can float away from your brain when you die.

- People who have near-death experiences supposedly come back with experiences and knowledge that they could only have if their soul floated away from their body while they were clinically dead. The problem is that even if such experiences are not exaggerated or confabulated, there are much more likely explanations for such experiences than the soul hypothesis.

- But the main reason most philosophers think that the soul hypothesis fails to answer the questions about minds and brains is that it's doubtful that souls actually exist. There are reasons, both philosophic and scientific, to doubt the existence of souls.

- First, the philosophical arguments for the existence of the soul are poor. Although Plato presented arguments about the soul, the most famous arguments for the existence of the soul are given by the philosopher René Descartes. He essentially argues that the mind must be numerically distinct from the body and brain—literally a different object—and thus be made of a separate substance. In other words, he argues that what we call "mind" must actually be a soul. He presents three basic arguments, but each of his arguments fails.

- Of course, that there are no good arguments for the existence of the soul doesn't 100 percent disprove the soul's existence, but their failure is still a major hurdle for soul belief. When it comes to existential matters—matters regarding whether or not something exists—the burden to provide evidence and arguments is on the believer. Without evidence or a good argument, skepticism is the rational position.

- Furthermore, there are convincing philosophical arguments against the existence of the soul. Suppose that souls exist and that your soul decides to move your arm. Why does this cause your arm to move and not, for example, the person sitting next to you? The decision was made by your soul, but in virtue of what is that soul yours? In virtue of what is that soul connected to your body?

- It can't be because it's closer to it; souls are nonphysical and thus have no location in time or space. And even if we ignore that and say that somehow your soul is closer to your body, it's still unclear how something that is nonphysical (like your soul) can move something that is physical (like your brain or body).

- The soul hypothesis is supposed to explain human behavior, but without a satisfactory account of soul-body interaction, this explanation just raises more questions than it answers. This problem of interaction has plagued dualists since at least Descartes's time and has yet to receive a satisfactory answer.

- In addition, even if we ignore this problem, the very concept of physical-nonphysical interaction raises other serious problems. A nonphysical entity like the soul reaching out and causing things in the physical world would violate three fundamental and well-established physical laws: the law of conservation of energy, which states that energy cannot be created or destroyed; the law of conservation of momentum, which states that the total momentum of any system always remains constant; and the causal closure of the physical, which states that physical events can only have physical causes. These problems constitute what is considered to be

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There are both philosophic and scientific reasons to doubt the existence of the soul.

the problem of downward causation, and it is a significant objection to the soul hypothesis.

- There are also scientific reasons to doubt the existence of the soul. Although not everything about how the brain works is fully understood, it is now undeniable that all mental activity is a direct result of brain activity. Everything that was once explained by the soul—emotions, language, decisions, sensation, memories, personality—is now explained by the activity of the brain, including activity in the limbic system, Broca’s and Wernicke’s areas, and the prefrontal cortex. There is nothing left for the classical soul to do and, thus, no reason to suppose that it exists.

- Defenders of the soul hypothesis will often claim that finding the neural correlates of mental activity does not mean that the soul doesn’t exist—because it could be that the soul controls the body by manipulating the corresponding brain areas, and that’s why they are correlated with mental activity. However, this argument is flawed.

- There is no reason to suppose the existence of an extra substance to explain the behavior of our bodies when there is already a perfectly good explanation within what we already know exists: the brain and its neural activity. To do so is clearly and simply a desperate attempt to save the soul hypothesis from the evidence.

The Implication That Souls Don’t Exist

- The implication that souls don’t exist might seem troublesome to some people. Often, people think that if souls don’t exist, then there is no God, all religion is false, we have no free will, and there is no afterlife. But none of this actually follows.

- First, souls have nothing to do with God’s existence. God can exist while souls don’t, and souls can exist while God doesn’t—there is no real relationship between the two. In addition, soul belief is not as ubiquitous among religions as one might expect.

- The existence of the soul also does not mean that there is not an afterlife. Even if your soul doesn’t float away from your body when you die, God could still resurrect you, or re-create you, or even steal your brain (and replace it with a dead replica) just as you die.

- The nonexistence of the soul might threaten free will, but it is not the only thing that threatens free will. And if the difficulties that will be discussed later can be overcome, the nonexistence of the soul can’t really be a threat. All the nonexistence of the soul entails is that a specific view of what people are is false.

Suggested Reading

Baker and Goetz, eds., *The Soul Hypothesis*.

Carter, *Mapping the Mind*.

Chalmers, “The Puzzle of Conscious Experience.”

Dennett, “Where Am I?”

Descartes, *Meditations on First Philosophy.*

Elwell, “Soul.”

Graham, *Philosophy of Mind.*

Hart, “An Argument for Dualism.”

“Immortality of the Soul,” *Jewish Encyclopedia.*

Jaegwon, *Philosophy of Mind.*

Johnson, “Do Souls Exist?”

Martyr, “The Opinion of Justin with Regard to the Reign of a Thousand Years.”

Long, “Descartes’ Argument for Mind-Body Dualism.”

Plato, *The Phaedo.*

Ramachandran and Blakeslee, *Phantoms in the Brain*.

Restak, *Brainscapes*.

Robinson, “Dualism.”

Russell, *What Is the Soul?*

———, “Is There a God?”

Sacks, *The Man Who Mistook His Wife for a Hat and Other Clinical Tales.*

Schick and Vaughn, *How to Think about Weird Things*.

Questions to Consider

1. The hard problem of consciousness is about how neural activity can produce mental activity. Is this a question that is even answerable? What could we learn, or what experiment could we do, to find the answer?

2. Where did you first hear about souls? Where did you first come across the idea that humans have souls? Were any convincing arguments or reasons put forth at that time for the existence of souls? Are there really any important consequences to doubting the soul’s existence?

Identity Theory—Token and Type

Lecture 3

The inadequacy of the soul hypothesis made philosophers seek to find the mind in the material world. The first suggestion, logical behaviorism, fell short but eventually led to identity theory—the notion that mental events are identical to particular brain events. Identity theory seems right because it seems obviously true that mental events cause bodily movements, brain events cause bodily movements, and bodily movements don't have two distinct causes. But it also seems to be that identity theory can't be true because mental events and brain events each have properties that the other lacks, and two things can't be identical if they don't share all the same properties.

Logical Behaviorism

- The hard problem of consciousness is the question of how brain activity produces mental activity: How is it that mental activity emerges from brain activity? Thus, the hard question assumes that mental activity emerges from the brain and, therefore, is dependent on it. Because the soul hypothesis denies this by supposing that mental activity exists separately and independently of the brain, it cannot answer this question.

- Of course, if mental activity were not dependent on brain activity and did not arise from it, the hard problem wouldn't really be a problem—our failure to answer that question would not be a concern. However, unfortunately for the soul defender, mental activity is, in fact, dependent on brain activity. So, the problem remains.

- The fact that there were early attempts to develop theories of mind that answered these problems but didn't succumb to the shortcomings of the soul hypothesis probably sounds strange to most modern ears. For example, logical behaviorism was a quite popular theory in the early 20th century. Behaviorism was motivated by a few things. First, because the idea that minds existed in a separable substance was so problematic, philosophers were highly motivated to find something in the world that they could point to and say, “That is what the mind is.”

- Second, logical positivism was very popular at the time. Logical positivism suggested that anything that could be true must be able to be verified and that the meaning of a proposition literally is the method by which you would verify whether or not the proposition is true. Because a person’s behavior was something in the world by which you could tell what mental state a person was in, logical behaviorists suggested that what it meant to say that someone was in a mental state was just that he or she was predisposed to behave in a certain way.

- This theory was better than the soul hypothesis. It was simpler, and it also was not subject to the problem of downward causation. But it very quickly succumbed to multiple objections. First, people can behave in a way that is consistent with being in a mental state but not actually be in that mental state. In addition, people can have a mental state but behave as if they do not. Behaviorism also can’t account for what mental states are like. Lastly, logical behaviorism is predicated on logical positivism, which was abandoned once it was realized that it was self-refuting.

Identity Theory

- The failure of logical behaviorism did not make philosophers retreat back to the soul hypothesis; the desire to find the mind in the world was still very prevalent. As we continued to learn more about the brain, we realized that the reason that we have the behavioral dispositions that we do is because of our brain states. Our behavior is caused quite literally by events in our brain. So, a new theory emerged that held our mind states to be identical to our brain states: It was called identity theory.

- We have learned that our behavioral dispositions are caused by our brain structure. To be disposed to behave a certain way is just to have a certain kind of brain structure—for our neurons to be configured and firing in a certain way. Because behaviorists identified our mental events as behavioral dispositions, and we came to learn that behavioral dispositions were certain kinds of brain events, it was quite natural to in turn claim that certain types of mental events are identical to certain types of mental events.

- First, when an identity theorist says that mind and brain are identical, they are using the term "identical" in the most literal sense possible. Identity theorists suggest that minds are numerically identical—meaning that they are one and the same thing—to brains. The first identity theory was called type identity theory, which suggested that every type of mental event was identical to a certain type of brain event.

- Type identity theory has quite a few advantages. It coheres very nicely with what we know about how the brain works. It also avoids any problems of downward causation and, if true, completely solves the hard problem of consciousness. If mental events are identical to brain events, we need not explain how one can causally affect the other. The hard problem of consciousness is also dissolved; we need not explain how mental events emerge from brain events if indeed they are numerically identical.

- Type identity theory ran into a problem, though, when we started thinking beyond ourselves. The way philosophers express the shortcoming is this: Type identity theory doesn't seem to account for multiple realizability; that is, it doesn't allow for the possibility of beings without brains like ours to be in mental states like ours. It seems that pain is multiply realizable; many different types of things can be in pain, and pain can be produced by different kinds of systems. So, if identity theory is going to survive, it needs to allow for multiple realizability.

- It is for this reason that token identity theory was developed. A token is a particular instance of a kind of thing. A pencil is a kind of thing, but the pencil in your hand is a token—a particular instance of that kind of thing. Token identity theory suggests that particular instances of mental events are identical to particular instances of brain events. So, your particular mental events are identical to particular brain events in your skull. But that doesn't mean that anything that is having the same type of mental events that you are has to have the same type of brain you do. In this way, token identity theory allows for multiple realizability, and yet is able to maintain that brain events are identical to mental events.

Objections to Identity Theory

- Both logical behaviorism and identity theory are classified as materialist theories, because they suggest that the mind can be found in the material world. Despite the persuasiveness of the argument for materialism, identity theory still faces some major objections and questions. The most significant objection is what can be referred to as the qualia problem. To understand the problem, one must first understand the basic rule in philosophy: the indiscernibility of identicals.

- If brain events and mental events are numerically identical—if they are one and the same thing—then they must share all the same properties. One can't have a property that the other lacks, and it certainly can't be the case that one possesses a property that the other can't have. However, this is exactly what seems to be the case.

- For example, location is not a property that a mental event like a belief or desire can have. However, every brain event does have a location—it occurs in a very specific spot inside your skull. So, brain events have a property that many mental event events lack: location. We could say the same thing about other properties that brain events seem to have that mental events lack, including mass. Thus, it seems that brain events and mental events cannot be numerically identical.

- The opposite is true as well. Think about color—or, more specifically, the property of color that your visual experiences have. Think about looking at an apple and what that experience

The only thing that is red about an apple is your visual experience of that apple.

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is like. Next, think about what happens in the world when you see an apple. Frequencies of light are emitted from the Sun or lightbulb that hit the apple. In high-frequency light, the waves are close together; in low-frequency light, they are far apart. The apple, due to the molecular structure of its skin, absorbs most frequencies of light but reflects a certain frequency of light. When that light frequency hits your eyeball, exposing the photoreceptors in your eye to a certain number of waves per second, your optic nerve sends a signal to your brain. Your brain's neurons fire in a certain kind of way, send signals along a few pathways, and eventually, a red experience emerges.

- Where is the red experience in that scenario? Can you find any redness in the physical world? The wavelengths aren't red—they are just waves that are spread out or pushed together in different ways. That frequency of light is not a color; it's just a collection of waves. The molecular structure of the apple is not red; it's just physically configured in such a way that it absorbs certain frequencies of light and rejects others. The photoreceptors in the back of your eye aren't red, the electrical signal sent along your optic nerve is not red, and none of your neurons are red. The configuration or activity of your neurons is not red.

- The only thing that is red is your visual experience. The property of redness is something that is only had by mental phenomena; no brain event is red. Mental events have properties that all brain events lack, so it seems that mental events cannot be identical to brain events. This is a pretty serious problem for identity theory, and no satisfactory solution to it has ever been offered.

- But there's another question that has to be answered by identity theorists: Token identity theory suggests that particular tokens of mental events are identical to particular tokens of brain events, and it leaves open the possibility of the same type of brain events being identical to other types of brain events.

- But what are the criteria for identity? What does it take for a mental event to be identical to a brain event? Consciousness does not accompany all brain events; in fact, most of what our brain does is unconscious. So, in virtue of what is a mental event identical to a brain event? And how could we tell what mental events a brain event is identical to? Although there is not one single answer to this question, there is a very popular answer: functionalism.

Suggested Reading

Armstrong, "Naturalism, Materialism, and the First Philosophy."

Chalmers, "The Puzzle of Conscious Experience."

Damasio, "How the Brain Creates the Mind."

Fodor, "The Mind-Body Problem."

Nagel, "What Is It Like to Be a Bat?"

Papineau, "The Case for Materialism."

Rorty, "Mind-Body Identity, Privacy, and Categories."

Smart, "Sensations and Brain Processes."

Questions to Consider

1. What other properties do mental events have that brain events seem to lack? What other properties do brain events have that mental properties lack?

2. Even though Clark Kent and Superman are identical, one might say that in a certain way, they have different properties. For example, Clark Kent wears glasses, but Superman does not. Is it possible to make sense of mental events and brain events being numerically identical, yet having different properties, in the same way?

Functionalism and Artificial Intelligence

Lecture 4

Token identity theory suggests that particular instances of mental events are identical to particular instances of brain events. However, token identity theory leaves open the possibility of multiple realizability: Different kinds of brains can have the same kinds of minds. So, which brain events are identical to mental events? And in virtue of what does that identity hold? The most common answers to these questions are found in functionalism, which is a favored theory of identity theorists for what makes a mental event identical to a brain event. Understanding functionalism is imperative to understanding philosophy of mind and leads us to considering other theories of mind.

Functionalism

- In philosophy of mind, functionalism is the idea that minds should have a functional definition. Functionalism usually is defined in terms of inputs and outputs: The same type of thing can be realized in multiple kinds of objects if those objects all give you the same outputs given the same inputs.

- The easiest example of something with a functional definition is a clock. Anything that consistently tells you the time of day is a clock—and many things can do this. A clock is multiply realizable. A clock might be made out of metal gears and springs, be made out of digital computer parts and have a digital display, have a combination of both, have a giant swinging pendulum like a grandfather clock, or just be a sundial. Each of these does the same thing—keep time—so they are clocks.

- Functionalists, in philosophy of mind, suggest that minds have a functional definition. Anything that functions like our brains should be said to have a mind. Anything that gives the same kind of outputs we do, given the same kind of input we receive, is minded. More specifically, anything that plays a role in a system like one of our mental states does would have to be that mental state.

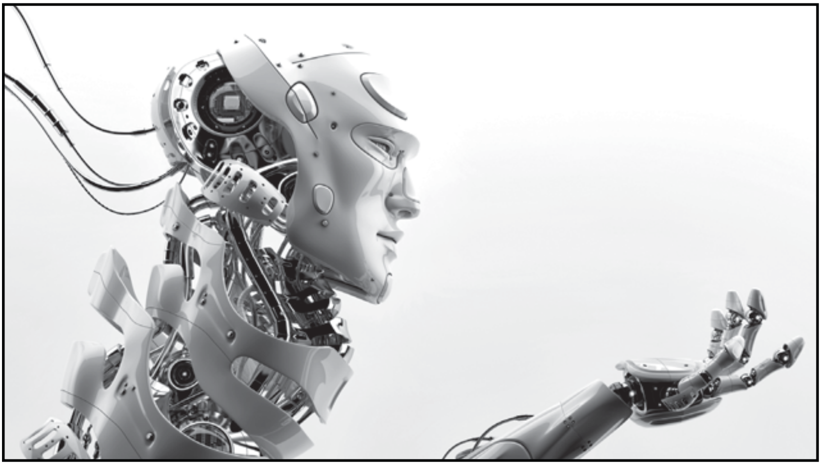
- Think again about token identity theory. Functionalism can help us identify which brain states mental states are identical to. Another reason the token identity theorists like functionalism is it allows them to preserve their intuitions about the identity of mind and brain. Recall that it suggests that even though the same type of mental state can be instantiated by different types of brains, each specific instance of a mental state is identical to a specific brain state. Functionalism allows for this to be true.

Artificial Intelligence

- Computers are consistently becoming more sophisticated. Not only can they do more, but they're also behaving like us more. In fact, there are computers that can seemingly think and understand language in almost the same way we do. It will only be a matter of time before they are behaving completely like we do.

- In other words, artificial intelligence like we have seen in television and movies—Data from *Star Trek*, Hal from *2001: A Space Odyssey*, and David from *A.I. Artificial Intelligence*—will likely one day be a reality. Let's call such creations androids, artificial beings that behave just like us. Would we, should we, say that such things, such beings, such creatures, are minded? This is an important question, and it may be one of the most important questions that humanity ever considers.

- The functionalist would of course say that they are minded. Because they behave like we do, they must have minds like we do. Essentially, the functionalist suggests that minds are like programs, and just like one and the same program can be run on an Apple or IBM computer, a mind can run on either a biological or a computer-based brain. But is this right? Would a computer running such a program be minded?



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Questions of mindedness arise with the increasing sophistication of artificial intelligence.

- Alan Turing was one of the earliest functionalists and suggested something that came to be known as the Turing test to determine whether a computer could understand language. He suggested taking a human being and a computer programmed to have a conversation and communicating with both by typing—like an instant messaging program. If you couldn't tell the difference between the responses given by the human and the responses given by the computer, then the computer would be said to have passed the Turing test, and according to Turing, this would mean that the computer genuinely understands language.

- We have yet to program a computer that can pass the Turing test, and a number of attempts have been made. One of the most famous programs is named Eliza. But the question remains: If and when we do have such a program, will a computer running it understand language?

- At the most basic level, a computer is a set of silicon chips that fire signals to each other in particular ways. The physical configuration that a particular chip or circuit has will determine whether it fires a signal to some other chip or set of chips in certain conditions. What we are doing when we program a computer is physically altering it, changing the configuration of its chips and circuits so that they fire in certain ways under certain conditions.

- What happens physically in a computer is very similar to what happens physically in our brains. Our brains are collections of neurons that are wired together in certain ways, and because of the way they are wired together, they cause us to behave in certain ways. In fact, in the same way that silicon computer chips send signals to one another based on their physical configuration, neurons send signals to one another based on their physical configurations.

- Whether we will one day write a program that can pass the Turing test is an empirical question. We'll just have to wait and see. But we might also produce conversational computers, or even fully functioning androids that behave just as humans do through a different method than direct programming. Perhaps we could produce a program that could pass the Turing test, or even produce human behavior, by using an evolutionary model.

- One way we might avoid having to figure out the program for ourselves is by reverse engineering: We can simply study how the neurons in the human brain are physically configured and then replicate that physical configuration in a set of silicon chips. Because such a configuration would be physically identical and thus functionally identical to our brains, a computer so configured would perform just as well as we would on a linguistic test, or behave as we would in real-world situations.

- Regardless of how we do it, once we develop androids, the questions surrounding whether they are minded and how we should treat them will be some of the most important questions humanity has ever considered. Think about how people will want to use androids and treat them. They can do our dirty work, including clean our houses, construct our buildings, and even fight our wars—everything we don't want to do. We don't have to worry about how we treat them only if they are not minded. But if they do have minds—that is, if they feel pain, have emotions, etc.—then it would seem grotesquely immoral to force them to do our dirty work.

The Mindedness of Androids

- Whether androids are minded will likely one day be one of the most important questions humanity has ever considered. So, how should we answer this question? First, let's consider reasons for thinking that androids would not be minded. One might argue that because they are programmed by us they can't have a mind, but there are a few things wrong with this reasoning. An android need not necessarily be programmed by us. It might be based on an existing human neural configuration, but its neural configuration may be its own—reached as a result of its own experiences with the world.

- Second, it's unclear why being programmed would somehow restrict consciousness; it's unclear why not being programmed is required if a being is to be minded. Ultimately, we think that we are minded beings because of how our brains function. That someone else programmed how your neurons are wired and fire would likely interfere with your free will, but it wouldn't mean that you don't have a mind. For the same reason, it would seem odd to conclude that an android is not minded merely because it is programmed.

- Probably the most obvious argument against the mindedness of androids is that mere functional equivalence is not enough to produce a mind. In order for a brain to have a mind, it has to be made of the right kind of stuff—the kind of stuff that can mentate. But the problem with this argument is that it does not lay down any criteria for determining what is necessary and sufficient for mentation. It gives a few examples of what won't work—including a pipe-and-valve system, or even rolls of toilet paper, that replicate the brain's function—but this doesn't really tell us much. Such systems may be logically possible, but they are not in reality physically possible.

- So, what is required? What kinds of substances can mentate? The following is a suggestion that is friendly to the artificial intelligence crowd: Any substance that can, as a real physical possibility, replicate the functioning of the human brain in real time can—when properly configured—mentate. If this is correct, then certainly androids would be minded. Because they behave like us, clearly the silicon out of which their brains are made is a material that can replicate the functioning of the human brain.

- One can still insist that silicon brains don't have what it takes to mentate, but the problem is that it's completely unclear what grounds such a suggestion would even be based on. We have no idea what makes us mentate, and we have yet to answer the hard problem of consciousness, so we don't know what is required for mentation. We just know that we have it. But without knowing what is needed for mentation, we have no way of knowing whether androids would have it. To assume they wouldn't would just seem to indicate a kind of unjustified bias—a species bias or carbon-based bias.

Suggested Reading

Bisson, "They're Made out of Meat."

Copeland, *Artificial Intelligence*.

———, "The Curious Case of the Chinese Gym."

Dennett, "Can Machines Think?"

Johnson, "Watson in Philosophical Jeopardy?"

———, "Will Watson Put Humanity in Jeopardy?"

Penrose, *The Emperor's New Mind*.

Searle, "Minds, Brains, and Programs."

Snodgrass, "The Measure of a Man."

Turing, "Computing Machinery and Intelligence."

Questions to Consider

1. Sometimes people ascribe personal characteristics and mental attributes erroneously to material objects. For example, if your computer keeps locking up, you might think that it just doesn't want to work—that it's out to get you. You might even yell at it, as you would another person. This is called the anthropomorphic bias. If you conclude that an android that behaves like a human has a mind, and treat it like a human, are you just showing an anthropomorphic bias? If not, what if you were to conclude that IBM's Watson, the Jeopardy-playing computer, is minded? Is that an anthropomorphic bias? At what point—at what level of complexity or behavior—should we conclude that a computer is minded?

2. In the movie *A.I. Artificial Intelligence*, we are shown a distant future where humanity has gone extinct and all that survives us is descendents of the androids that we built. Suppose that such artificial beings explored the universe and came across a planet of biological beings like us. What would they conclude about whether or not such beings have minds? Would an advanced android conclude that biological organisms were too primitive to mentate? To help you consider this question, check out a short story by Terry Bisson called "They're Made out of Meat." Consider how this story might reveal our own "carbon" biases.

3. Philosopher John Searle claims that the room in his Chinese room thought experiment is functionally equivalent to a native Chinese speaker. But it would take weeks, even years, for a person in the room to look up the exact question and find the appropriate answer. It could take up to a decade to complete a conversation. Eventually, the room would produce the same outputs given the same inputs, but is the amount of time it takes to produce those outputs relevant to whether or not the room is functionally equivalent to a native Chinese speaker?

Alternative Theories of Mind

Lecture 5

We know that our behavior is dictated by the structure of our brain; the way our neurons are wired and fire determines our behavior. So, taking certain advancements in science as a model, some philosophers have suggested that the reason the philosophical questions about the mind that we have been considering are so elusive is because they are bad questions to begin with—because, they suggest, minds don't exist. They are fictions. All that exists are brains, and that is all that needs to be accounted for.

Eliminativism

- Eliminative materialists suggest that we no longer need to hypothesize the existence of minds to account for human behavior. Explanations for why we do what we do can now be had solely by referring to the activity of our brains. So, because minds are no longer needed to explain anything, we should eliminate them.

- We should also no longer talk as if minds exist and as if they causally affect the world. We should no longer think that people do things because they have certain beliefs, desires, or experiences. Eliminative materialists call such talk "folk psychology," and they think it should be eliminated.

- Embracing eliminative materialism has a lot of philosophical advantages. First, it is quite simple. The fewer assumptions that a theory makes, the fewer number of entities it requires to be true, the simpler it is. Because eliminative materialism eliminates the mind, and all other theories suggest that minds exist, it is simpler. And simplicity is a virtue in both science and philosophy.

- Eliminative materialism also explains quite nicely why all the other theories of mind, including those we have yet to consider, are subject to so many convincing objections. They have been trying to explain minds when minds don’t exist in the first place. It even eliminates the hard problem of consciousness. If there is no mental activity, there is nothing to account for. In addition, because it eliminates the mind, eliminative materialism does not suffer from any of the problems that have plagued the other theories we have considered so far.

- Of course, a number of objections have been leveled against eliminative materialism, some more successful than others. Ultimately, the most obvious and successful objection to eliminative materialism is this: The existence of the mind seems undeniable to most people. Eliminative materialists are suggesting that you have no mind. So, you are not having experiences right now. All that is happening are events in your brain.

- This seems obviously false. Eliminative materialists are denying the existence of something that we seem to have direct awareness of: our minds. In fact, many philosophers have argued that the only thing that people actually do know for sure is that they have a mind—that they are having experiences. You might be trapped in a computer simulation and the world might not be real, but you are still experiencing what the computer simulation is feeding you.

- Even though eliminative materialism is great as philosophical theories go—it’s nice and simple and avoids the objections that plague the other theories—eliminative materialism is one of the most unintuitive theories that exist in all of philosophy.

- The eliminativist will point out that our intuitions, and even our introspection, are not always reliable; in fact, they very often lead us astray. For example, people will often think that they are in love when they are not. Eliminative materialists suggest that the existence of minds might be like this as well.

- But regardless of how often introspection leads us astray, many philosophers simply find eliminative materialism too hard of a pill to swallow; they can't deny that their own mind exists. If you are like them, don't fear—there are more alternatives.

Property Dualism

- Property dualists, recognizing the problems faced by the soul hypothesis and the suggestion that minds are made up of a separate substance, suggest that minds are made up of a different kind of property. They believe that there is only one kind of substance: matter—the material that makes up the physical world. But they think that substance has two different kinds of properties: physical properties, such as location, mass, and charge; and mental properties (qualia), such as the "aboutness" that a belief has, the intentionality that a decision has, and the redness that a visual sensation has. The mind consists of the collection of these properties.

- A few property dualists called panpsychists think that all material in the universe has some degree of mentality—even atoms have mental properties to some degree. But most suggest that it is only when a brain becomes sufficiently complex that such mental properties exist. Property dualists suggest that these properties are emergent nonreductive properties.

- An emergent property is a property that is had by a whole that is not had by its parts. For example, think again about the heaviness of a car. Being heavy is not a property that the individual atoms of the car possess, but it is a property of the car itself. Therefore, heaviness is an emergent property.

- A reductive property is a property had by a whole that can be explained in virtue of the properties of its parts. For example, you can explain the heaviness of the car by referring to the mass of its individual atoms.

- Property dualists suggest that you cannot explain mental properties in this way—they are nonreductive. So, the existence and powers of mental properties cannot be explained in terms of or with reference to physical brain events. Their existence is dependent on brain events, because they are a property of physical matter that makes up the brain, but mental properties are not reducible.

- Property dualists believe that these mental properties have causal efficacy; they make events happen in the physical brain (that ultimately affect how our bodies behave) that would not happen if they did not exist. In this way, property dualists are able to preserve the intuition that the mind has causal efficacy.

- Of course, the hard problem of consciousness is still left unanswered; one wonders why nonreducible mental properties emerge from sufficiently complex brain structures. The property dualists have an answer to this question: They suggest that we hypothesize a fundamental law to account for why this occurs. That it occurs is simply a brute fact of the universe, a fact that just is true for no other reason than it simply is true.

- Property dualism avoids many objections that plague other theories. It doesn't deny that the mind exists like eliminative materialism. Also, because it doesn't suggest that minds are identical to brains, but maintains that physical and mental properties are different, it does not need to account for how they can be identical yet have different properties. It also has numerous advantages. It doesn't contradict neuroscience, like the soul hypothesis, because it admits that the mind is dependent on the brain. It also preserves the notion that minds have causal efficacy—that they actually have an effect on the world.

- But property dualism is also subject to numerous objections. For example, without an example of a nonreductive emergent property, the existence of the mind as a nonreductive emergent property is problematic, because we are not sure that the existence of such a thing is even possible. The uniqueness of such a property is a major downfall for the theory.

Epiphenomenalism

- The problems that property dualism has accounting for mental causation can be avoided by embracing a somewhat similar theory called epiphenomenalism, which suggests that the mind does emerge from brain activity, just like property dualists. In fact, the best candidate for the kind of brain events that mental phenomena emerge from are those that function the way that functionalism suggests. So, epiphenomenalism is compatible with many other theories.

- However, epiphenomenalists suggest that the mind doesn't do anything; it has no causal powers. Minds are what some philosophers have dubbed "causal danglers"—things that exist but don't have any effect on the way the world goes or what bodies do.

- Epiphenomenalism has many of the same advantages as property dualism. It doesn't deny the existence of minds, it can account for qualia, and it coheres with what neuroscience has demonstrated is true: The mind's existence is directly dependent on the existence of the brain.

- It also avoids all the objections that are leveled against the other nonmaterialist theories. Because it suggests that minds have no causal powers, it does not need to account for downward causation or explain away how mental efficacy violates known physical laws. It seems to have all the advantages of both the materialist theories and the nonmaterialist theories.

- However, there is one big exception: It denies that minds have causal powers. The intuitive force of the notion that minds have causal powers is very strong. A husband's love for his wife makes him kiss her on the cheek; it seems to be a fact that the husband's mental events have a direct causal effect on the way he behaves. And if it does, epiphenomenalism can't be true.

- Epiphenomenalists will insist that seeming fact is an illusion, one propagated by logically fallacious thinking. Specifically, they will say that the intuition that mental events cause our behavior invokes the causal fallacy. The causal fallacy comes in many different varieties, but the most well-known one fallaciously reasons that correlation necessarily entails causation. It does not. The fact that two events are correlated does not mean that one causes the other. The correlation may be a coincidence, or the result of them both being caused by some third event and not directly causally related themselves.

- It might seem that mental events cause human behavior because they are closely correlated, but it does not follow from this that one causes the other. It might be that they are correlated simply because they are both caused by a common third event. And, in fact, this is exactly what the epiphenomenalists suggest.

- The idea that mental events are not causally efficacious might be too hard for you to swallow. After all, something that exists but doesn't do anything would be a unique phenomenon indeed. If that's the case, you are not alone. Many philosophers don't like epiphenomenalism for just this very reason.

Suggested Reading

Churchland, "The Hornswoggle Problem."

Jackson, "Epiphenomenal Qualia."

Lycan, "Is Property Dualism Better Off Than Substance Dualism?"

Ramsey, "Eliminative Materialism."

Schneider, "Rethinking Physicalism."

Thatche, "Christian Theism and the Concept of a Person."

Questions to Consider

1. Would it really be possible to eliminate folk psychology from our vocabulary? Neuroscientists might be able to only talk in terms of brain events, but could the general public?

2. Is it possible that all material in the universe has mental properties to some degree? Quantum mechanics shows us that some behavior at the level of very small particles is random and unpredictable. Does the idea that such particles are conscious to some degree help account for this?

3. How problematic is it to abandon the idea that mental events cause human behavior? Could it really be that mental events and human behavior simply have a common cause: brain events?

The Problem of Personal Identity

Lecture 6

In this lecture, you will be introduced to and come to understand a very important metaphysical question—the question of personal identity over time. How is it that you now and your eight-year-old self are numerically the same person? You will also learn something that is common in metaphysics: The easy, obvious answer doesn't work. Although the soul hypothesis is very popular, it falls drastically short as a metaphysical hypothesis and can't account for personal identity over time.

The Ship of Theseus

- The question of whether persons exist is not a question about the reality of the outside world. Instead, we are wondering whether persons exist at all—whether persons are real, existing objects. And for the sake of argument, we will grant the assumption that human bodies exist. The question is whether distinct entities called persons, connected to but above and beyond human bodies, exist.

- Clearly, the mere existence of a person's body is not sufficient for that person's existence—the fact that persons are no longer where their dead body is shows this. But that doesn't mean that the person can exist without a body; maybe having a body is necessary, or maybe not. But the point is that this is the concept of personhood philosophers have in mind—it's a kind of discrete object that, we might say, exists in addition to a physical body but may or may not be dependent on it.

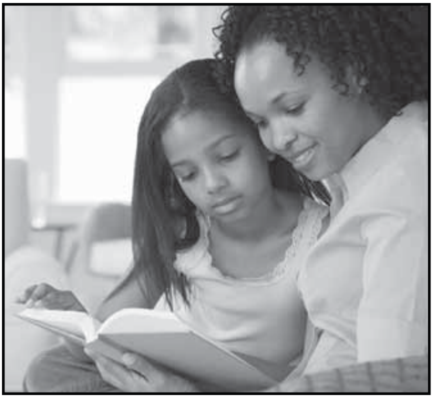
- That persons exist, and that you are identical to your past self, is something that we will begin by assuming. But now that it is assumed, we will scrutinize those assumptions to determine whether or not they are true. The question we will consider is this: Assuming that you now and your eight-year-old self are the same person, in virtue of what is this true? What makes that identity hold?

- To get at exactly what this question is asking, philosophers often consider what is called the ship of Theseus thought experiment: Suppose that a man named Theseus owns a ship, and the ship is about to go on a seven-year journey, so he packed it full of wooden barrels of food for its crew. The ship sails off, and along its journey, the wood out of which the ship is constructed starts to rot away, piece by piece. So, the crew uses the wood from their used barrels of food to repair the ship, replacing one plank at a time and throwing the old, rotted planks overboard.

- It's a long journey, and by the time they reached their destination, each original plank of wood has been thrown overboard and replaced with a plank of wood from one of the barrels. Is the ship that arrives at its destination point seven years later Theseus's ship? Is it one and the same object? If Theseus were to receive a reward for his ship successfully making the journey, should he receive the award? If the ship returns to his home, can he truthfully claim it's his ship? Or is it another ship, made out of barrels? If it is still Theseus's ship, in virtue of what is it the same ship? Why is it the same ship?

- This example reveals why we can't just say that you now and your eight-year-old self are the same person because they have the same body—that is, because they are made of the same material. Just like the ship of Theseus, your parts are replaced over time as well. On average, about every seven years, your body is made of entirely new material. Just like the ship of Theseus, the material that makes you up is thrown out into the world and replaced with new material that you take on through ingestion—not unlike the barrels on Theseus's ship. So, the question remains: In virtue of what are you and the ship of Theseus the same object over time?

- Figuring out the answer to this question is very important. Not only is our very concept of personhood up for grabs, but also only if we can make sense of personal identity over time can we hope to make sense of an afterlife. If you are to survive your death, some person that exists in heaven after your death has to be numerically identical to you—in the same way that you are numerically identical to your eight-year-old self. If not, then you didn't really survive into the afterlife. If it turns out that what preserves personal identity is somehow irrevocably broken upon death, and thus no person in the afterlife could be identical to you, then survival into an afterlife is impossible. The same would follow if the very concept of personal survival over time, or even personhood, breaks down.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If souls exist, we have no way to distinguish one soul from another.

Revisiting the Soul Hypothesis

- Probably the most common answer to the question of personal survival over time—why are you now and your eight-year-old self the same person?—is because you have the same soul. This is the classic Platonic concept that many non-metaphysicians embrace.

- A soul is a separate substance that contains our mentality. The soul hypothesis is the idea that our mind is a distinct entity that is separable from our body and brain. A common belief is that we each have a soul over the course of our life, and it is in virtue of having a soul that we are the same person over time, and when we die, our soul floats away from our body and enters the afterlife. So, how is it that some person that exists in heaven after my death can be identical to you? Because that person has, or simply is, your soul.

- But there are a number of objections. There are many philosophic and scientific problems with the soul hypothesis. But even if we grant that souls exist, they actually can't help us answer the problem of personal identity over time. In other words, even if you have a soul, it could not be in virtue of the fact that you have the same soul over time that you are the same person over time. This is true for three reasons.

- First, if souls preserve personal identity, then they also preserve personal distinctiveness. In other words, the reason that two people are not the same person would have to be because they don't have the same soul. But that means that their souls must be distinguishable; their souls can't actually be numerically identical. But in virtue of what would they be different?

- The truth is that if souls exist, we know nothing about them, and we have no way to distinguish one soul from another. So, we can't use souls to distinguish persons; explaining one thing with something else that itself needs explaining is not philosophically enlightening.

- Second, souls can preserve personal identity over time only if they are sufficient for personal survival. In other words, souls can account for personal survival only if having the same soul over time is enough to preserve personal identity. But it seems that this is not the case.

- Third, souls can preserve personal identity over time only if they are necessary for personal survival. In other words, souls can account for personal survival only if you must have the same soul over time to be the same person over time. But, again, this doesn't seem to be the case.

- The next time you're sitting in a room with someone else, how do you know that you didn't switch souls? We're not talking about your soul leaving your body with all of your thoughts and memory and personality and placing it in someone else's body—and someone else's soul doing the same thing to your body. If that happened, it would be clear that it had happened. Instead, we're just talking about the soul—the substance that supposedly contains your memories and personality.

- If your mind was dumped into a new substance, and the substance that used to contain your mind went to someone else, how could you tell? What difference would it make? Because there is nothing to distinguish such substances, it seems that there would be no way to tell. It wouldn't make any difference. For all we know, this happens all the time. And so there is no real reason to think that such a substance exists.

- It can be rational to believe that something that is unobservable exists. For example, scientists rationally believed in the existence of atoms (and their corresponding nucleus and electron shells) although they weren't able to directly observe them or even have any kind of direct physical evidence of them at first. Even before they were observed, the existence of atoms explained many different phenomena in science that had no other good explanation. Explanatory power is very important, and the fact that a hypothesis offers up a good explanation is powerful evidence in its favor.

- If the soul hypothesis were able to explain how we are the same person over time, then that would be powerful evidence in its favor. But unfortunately, the soul hypothesis cannot explain personal identity over time. Having the same soul is neither necessary nor sufficient for personal survival, and what would distinguish one soul from another, and even what souls are made of, is a complete mystery. So, there is no reason to suppose that they exist—much less to think that they can provide an answer to our questions about personal identity over time.

- In fact, so little is understood about the soul that relying on it as an explanation for personal survival is as bad as giving no explanation at all. The soul is an indescribable non-understood substance for which we have no evidence. Suggesting that it accounts for how we are the same person over time is no better than saying "you just are" or "it's just magic."

Suggested Reading

Dennett, "Where Am I?"

Glover, *I*.

Johnson, "Is the Doctor Still the Doctor—Am I Still Me?"

Kolak and Raymond, *Self and Identity*.

Olson, "Personal Identity."

———, "There Is No Problem of the Self."

Strawson, "Self, Mind and Body."

Swinburne, *The Evolution of the Soul.*

Questions to Consider

1. Suppose that you pointed out to someone the problems with thinking that the survival of one's soul can facilitate their survival into the afterlife. Suppose that their answer was simply, "I don't know—it just does. God makes it work." How intellectually satisfying would you find that answer?

2. Suppose that someone were to dump your mind into someone else's brain, and their mind into your brain. Then, one of those bodies was going to receive an extreme reward—for example, $1 million and a lifetime of massages. If you had to decide beforehand which one would be rewarded, and assuming that you are selfish and would want the reward for yourself, which body would you select to be rewarded?

Mind, Memory, and Psychological Continuity

Lecture 7

In this lecture, you will consider the preservation of one's mind as a way to preserve personal identity over time. You will start by considering only the preservation of memory, but you will then turn to considering the preservation of one's entire psychology. However, it turns out that both theories seem to fall short. Not only does a break in memory or psychological continuity not always result in a break in personal identity, but also by such criteria it is possible to have more than one of the same individual, which leads to logical contradiction.

Memory

- One thought experiment philosophers often use to pull out our intuitions on personal identity over time is the transporter example. On *Star Trek*, they often travel by transporter: They step into a device that records the configuration of all the atoms that make up their body and converts those atoms into energy. The device then moves that energy to a different location—usually an alien planet—converts it back into atoms, and then reconfigures those atoms back into the original configuration.

- The resulting person is physically identical to the original that stepped into the transporter, all the way down to his or her neural structure. Consequently, this "new" person has the same memories, the same personality, the same wants and desires, and he or she knows the mission he or she was sent to the planet for—in other words, his or her entire mentality is identical to the mentality of the original person. Let's call this material transportation.

- Once material transportation is complete, is the person that appears on the planet the same person, numerically, that stepped on the transporter pad? Suppose that Spock is the one beaming down. He steps on the transporter pad, disappears, and a person on the planet appears who looks just like Spock, is logical just like Spock, and has Spock's beliefs, desires, memories, and personality. His body is even made of the same material; it's just been disassembled and reassembled. Is he Spock, or merely a duplicate of Spock? Did Spock transport himself to the planet, or did he die and create a replica of himself? Is the transporter really a transporter—or is it a suicide copy machine?

- On the show, things didn't always go as planned: The information about the body's configuration would arrive, but something would disrupt the transfer of the original energy, and it would be lost. The Enterprise has plenty of energy to spare; they could take a new set of energy, convert it into matter, and configure it based on the original blueprint. Once again, the resulting person would be physically and mentally identical to the original. Let's call this information transport. Would information transport preserve personal identity? If that happened to Spock as he was beaming back to the ship from the planet, did he really return to the ship, or did he die and merely a copy of him was created?

- What your intuition tells you about how to answer these questions reveals your intuitions regarding what you think is required for the preservation of personal identity over time. The philosopher John Locke would think that in both examples—material transport and information transport—personal identity was preserved. Why? Because Locke thought that memories are what preserve personal identity.

- The basic idea is this: It is because the person on the planet remembers everything that Spock does, including stepping onto the transporter pad, that the person on the planet is identical to Spock. And for the same reason, the person who returns to the Enterprise, even though he's made up of different matter, is also identical to Spock—he still shares all the same memories. And it is in virtue of the fact that you remember being your eight-year-old self that you now are numerically identical to your eight-year-old self. It is memories that preserve personal identity.

- But there are a number of problems with Locke's memory criterion. For one thing, if you happen to forget some part of your life, that doesn't mean that you were numerically a different person during the time you forgot. In addition, your memory has significant gaps in it. So, it doesn't seem that memory really tracks personal identity in the direct corresponding way that it should.

- Another significant objection to the memory criterion is that it seems to be circular. Think about it this way: We know that your memories are encoded into the neural structure of your brain, but that means, at least conceptually speaking, that your memories could be implanted in someone else. All you have to do is arrange the necessary parts of their brain like yours.

- So, would getting someone else's memories make you identical to that person? It seems not. Your memories belong to you; you don't belong to your memories. It seems plainly obvious that someone could possess memories that are not their own. But if continuity of memories is what preserves personal identity, this is impossible—you would be identical to any person whose memories you shared.

- To avoid this consequence, memory theorists suggest that the memory has to be genuine—it has to belong to you—in order to preserve personal identity. But now they are appealing to facts about personal identity in order to make sense of which memories belong to you when they were originally using memory to make sense of personal identity. We're arguing in a circle.

Psychological Continuity

- Memory is only one aspect of your mental life. You also have beliefs, desires, and a personality—an entire psychology. Perhaps it is the preservation of that psychology over time that preserves personal identity over time.

- We wouldn't want to say that having the same psychology that you have right now is necessary for your eight-year-old self to be identical to you; the psychology that you had is remarkably different than the one you have now. But from moment to moment, your psychological states are directly connected: The memories, beliefs, wants, desires, and personality you have at this moment are directly related, even causally related, to the ones you had a moment ago—many of them are even the same. And those psychological states are related to the ones you had before that, and the day before, etc. There is a strong psychological connection between the temporally adjacent moments of your life.

- In virtue of this, there is a psychological continuity that runs throughout your entire life. Therefore, even though you now and your eight-year-old self are not directly psychologically connected, they are psychologically continuous. So, it is in virtue of psychological continuity that you are the same person over time.

- We probably want to add a little bit to our criteria of psychological continuity to avoid counterintuitive results revealed by thought experiments. For example, suppose that you went to bed tonight and died in your sleep. Suppose that at the same time that happened, on the other side of the planet, someone hit his or her head in just the right way so that it knocked him or her out, but when he or she came to, he or she had an entirely different psychology—a new personality, a new set of memories, beliefs, and desires. Everything about this person's psychology changed. And suppose, by a complete coincidence, that his or her psychology was perfectly continuous with yours, including memories and personality. Again, the fact that this happened has nothing to do with the fact that you died and would have still happened had you not died. Would this person be numerically identical to you? Did this strange coincidence prevent your death?

- Most philosophers think not. It seems that if some future person is going to be you, there has to be some kind of causal connection between you and that person. The reason that the future person has the psychology they have has to be in some sense brought about by the psychology that you now have. That they have a psychology continuous with yours can't be a mere coincidence.

- So, very formally, we could put our psychological continuity criterion for personal identity over time like this: Psychological continuity exists between persons IFF (if and only if) there are overlapping chains of strong psychological connectedness, and those persons are numerically identical (they are one and the same person) IFF there is psychological continuity and that continuity is a result of a causal connection.

- Some might wonder if any kind of causal connection will do; after all, the causal connection that exists between your psychological states on a day-to-day basis is different than the causal connection that exists between, for example, the Spock that steps on the transporter pad and the one that appears on the planet.

- But when you start digging into it, and trying to figure out the difference between different kinds of causal connections, and which ones would preserve identity, usually you just end up arguing in a circle. You'll just end up saying that the kind of causation that is necessary to preserve identity is the kind that preserves identity—which is not an enlightening definition.

- For this reason, usually philosophers that defend the psychological continuity criterion think that any kind of causation will do; as long as it's not a coincidence, identity is preserved. But despite the intuitiveness of this theory, it falls prey to some pretty serious objections.

- First, our intuitions about the survival of personal identity seem to be conflicting. Second, we think that there is more to personal survival than mere psychological continuity. Even if our psychology is completely erased and replaced, it would seem that we still exist—we just have new psychology. If so, the psychological criterion seems to fall short.

- But maybe your intuitions about this are consistent. If so, your intuitions strongly align with the psychological continuity criterion.

But even so, there is still a pretty significant objection to this criterion that doesn't merely seem to defy intuition, but defies logic.

- The crux of the problem is this: Personal identity is unique; one and only one thing can be identical to you. However, it seems that more than one thing can be psychologically continuous with you. Thus, it seems that psychological continuity cannot account for personal identity; psychological continuity and personal identity are different kinds of relations.

Suggested Reading

Locke and Reid, "The Problem of Personal Identity."

Locke, "An Essay Concerning Human Understanding."

Parfit, "Personal Identity."

Reid, "Of Identity."

Questions to Consider

1. What elements of your psychology are most important for your survival? Are there parts of your psychology that you could lose and still be you? How much could you lose at once and still be you?

2. If one day we really do develop transporter technology, would you feel safe using it? If it disassembled and then reassembled you in a new location, would you feel like you arrived in the new location? Or would you fear that upon being disassembled, you would cease to exist?

Same Body, Same Brain, and Closest Continuer

Lecture 8

In this lecture, you will consider numerous theories that try to account for personal survival over time: psychological continuity, physical continuity, and the closest continuer view. They all fall short in one way or another. This might be for two reasons. The failure of these theories might suggest that persons don't exist at all, so trying to identify what preserves personal survival is guaranteed to fail. Another possible reason is because we've been looking at the question in the wrong way and thinking about persons in the wrong way. Maybe persons exist, but not like we think they do.

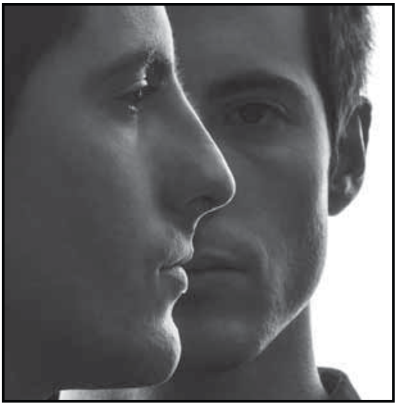
Physical Continuity

- Instead of psychological continuity, perhaps it's physical continuity that matters for survival. Maybe it is in virtue of you and your eight-year-old self having the same body that you are the same person.

- Merely having the same body over time won't preserve personal identity. Technically, you do not have the same body that you did when you were eight years old. Over time, your body replaces its material with material that you ingest so that after roughly seven years, your body is made of completely new material.

- But maybe we can reconceive what it means to have the same body. Your body replaces it cells and atoms with new material, but maybe that replacement happens gradually enough that we can still say it is the same body. So, maybe it is in virtue of you having the same body now as you had when you were eight years old that you now and your eight-year-old self are the same person.

- But even if gradual replacement can preserve identity, there is still a problem. It doesn't seem that the preservation of your entire body is what matters. Suppose that you lose a leg. Are you still the same person? Suppose that you have heart problems and someone donates a heart to you. Are you still the same person? Suppose that one day in the future we perfect the full body transplant, where, if your body is damaged, we can take your brain and place it into a new body, saving your brain. Would you still be the same person?



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Are you still the same person over time—as your body and personality change?

- Depending on what kind of body you get, your personality might change—but you would still be the same person. Because your brain is what realizes your psychology, it is the physical continuity of your brain specifically that would seem to matter for survival.

- But this is also a little shortsighted. After all, once you die, and your brain ceases to function, it still exists—that piece of you in your corpse's skull is physically continuous with the brain you had in life. But you no longer exist. If you think that the survival of your brain is what preserves personal identity, you don't think it's just the existence of your brain—it has to be functioning, too. So, perhaps it is the physical continuity of a functioning brain that preserves identity over time.

- Recently, some people have taken to freezing themselves before death in the hope that one day medical science will develop a cure for what is killing them—and then they can be thawed out, cured, and sent on their way. We have yet to do this successfully, but if one day we do, the person who was thawed and cured will still be the same person who was dying and frozen. However, there was a period of time during which they had no functioning brain—the physical continuity of their functioning brain was broken. So, we need a criterion that allows for cryogenic patients to still be the same person once they are thawed and cured.

- The philosopher Peter Unger proposes just such a criterion: Suppose that some person X right now has mental capacities. Some future person Y is identical to person X—in other words, X will survive into the future—if and only if three things are true: Person Y has to have mental capacities, the brain that realizes person Y's mental capacities has to be physically continuous with the brain that realized person X's mental capacities, and there has to have been no moment in time between the existence of person X and person Y where that physically continuous object—that brain—did not have mental capacities.

- Regardless of how well thought out and nuanced Unger's criterion is, it is subject to a few pretty serious objections. But to understand these objections, you'll need to understand the problem with metaphysical vagueness.

- A concept is vague when it is not always clear when something matches up with it. We can't tolerate vagueness when we are dealing with numerical identity. Either something is the same object, or it is not. In the same way, it seems that either some future person is identical to you, or that person is not. Personal survival is not a vague notion; therefore, there must be a concrete answer to questions of personal survival. This means that our criterion of what accounts for personal survival cannot be vague—it cannot give us indefinite answers to any questions of personal survival.

- The problem with Unger's criterion is that it does not do this. As nuanced as it is, it's still subject to vagueness. Unger's view also seems to underappreciate the importance of the preservation of one's mind for survival.

- We might try to combine a few views to arrive at a better criterion. Maybe both psychological continuity and physical continuity play a role in preserving personal identity. This is perhaps the most intuitive theory we have been introduced to so far. But it, too, is subject to the problem of metaphysical vagueness simply because both psychological and physical continuity are a matter of degree. In fact, all the criteria up until this point have been subject to something like this problem.

The Closest Continuer View

- To deal with this problem and others like it, the philosopher Robert Nozick developed the closest continuer view. Our intuitions about personal identity seem to conflict. Nozick accounts for this intuition by suggesting that whether and in what body you survive is sensitive to context. Basically, you will always be the closest continuer—that is, you will be the future person that is most similar to you right now.

- What does Nozick mean by similarity? In short, the person most similar to you is the one who shares the most psychological and physical continuity; although, Nozick puts more importance on psychological continuity.

- So, of course, in everyday survival, you are the same person over time because there is only one obvious candidate; moment to moment, the person in your body is the closest continuer to the person that was in your body a moment ago. And the person you are now is identical to your eight-year-old self because you are your eight-year-old self's closest continuer; no presently existing person has such a high degree of psychological and physical continuity with your eight-year-old self than you.

- The closest continuer theory gives intuitive answers to most of the thought experiments that such theories are subjected to. Would you survive a brain transplant? Yes. Would you survive the extraction of half of your brain? Yes. Would Spock be the same person as he beams down to the planet? Yes. And if his signal were interrupted while beaming back to the ship, and the Enterprise had to use new matter to save him, he would still be Spock—that is the closest existing continuer.

- If you died and someone by pure coincidence awoke on the other side of the world with a new psychology that was completely continuous with yours, even though that is the closest continuer, Nozick wouldn't say that is you—he thinks that the continuation must have to have a causal component.

- But the closest continuer view can successfully answer many thought experiment counterexamples that have been raised by philosophers against other theories. For example, what if you step in a transporter to Mars; it records your information, destroys your original body, and creates a new person on Mars with new material. That would be you, right?

- But suppose the transporter didn't destroy you—it just records your physical structure and sends that information to Mars, where a transporter there takes new existing matter and constructs a new body based on that structure. That person isn't you, right?

- It seems not, but the only difference between the two stories is your destruction; there is psychological continuity in both. Some philosophers use this example to argue against the pure psychological criterion.

- However, Nozick's closest continuer view gives us a nice answer to both cases. If your original body on Earth is destroyed, then the person on Mars is you because that's the closest continuer. If your original body is not destroyed, then the person on Mars is not you, because the closest continuer is on Earth. That body is both psychologically and physically continuous with the original.

- But there is one counterexample that even Nozick himself admits his closest continuer theory can't quite handle. According to Nozick, if you step in a transporter and your original matter is destroyed but your physical configuration is transmitted to Mars and a psychologically identical person is created, that person on Mars is you—he or she is the closest continuer. But if your matter is not destroyed, the person on Mars is not you—he or she is merely a duplicate. The person still standing in the transporter on Earth is the closest continuer.

- Now suppose that the transporter on Earth doesn't destroy your matter instantaneously, but the scanning process is such that it injures you in some way, entailing that a year later you will die of a heart attack. Is the person on Mars you? No, and even after you die, that person will still not be you; it's not like your death would kill the person that now inhabits that body on Mars. The person on Earth is still the closest continuer.

- But what if you continue to live on Earth for only 1 hour? Would the person on Mars be you? Again, it seems not. But what if you only lived for 30 minutes, or 1 minute, or 1 second, or even 1 millisecond? If there is any overlap at all, where in the same moment there is a psychologically continuous person on Mars but a psychologically and physically continuous person on Earth, the transportation process does not preserve identity. But that seems rather odd—surviving for 1 millisecond could mean that you don't survive at all? You can imagine a very strange scenario where someone steps into a transporter on Earth and then says, "Quick, kill me, before the new person is constructed on Mars; otherwise, I might die."

Suggested Reading

Davis, "Life after Life."

Hick, "The Resurrection of the Person."

Kurzweil, "The Coming Merging of Mind and Machine."

Noonan, "The Only X and Y Principle."

Nozick, "Personal Identity through Time."

Olen, "Personal Identity and Life after Death."

Unger, "The Physical View."

Van Inwagen, "The Possibility of Resurrection."

Questions to Consider

1. Nozick's closest continuer view suggests that, like the survival of organizations, the survival of persons can be dependent on context—on whether or not there is some other person that is a closer continuer. But there has to be a yes-or-no answer about whether or not a person survives. Must there be a yes-or-no answer about whether an organization survives? How might this affect the viability of Nozick's theory?

2. How important is it to you that you are able to survive into the afterlife? The afterlife is supposed to be eternal, right? Even if it were utopia, wouldn't you eventually get bored? Wouldn't you eventually do everything there is to do so many times that you'd be sick of it? Wouldn't an internal utopia eventually become hell?

The No-Self Theory and Time Worms

Lecture 9

When it comes to the question of personal identity, the failure of many theories has led some philosophers to conclude that there are no persons. This theory has its merits, but it's still a hard philosophical pill to swallow. David Lewis developed the time worm theory, which conceives of persons in a totally different way—as four-dimensional objects spread out over time. Although intuitive in many cases, Lewis has problems dealing with how to describe spinoff persons and Alzheimer's patients. In addition, his theory seems to suggest that because a person would not exist until his or her time worm were complete, persons don't exist until they die.

The No-Self Theory

- Some philosophers, especially the American pragmatists like Charles Sanders Peirce and William James, thought that most philosophical problems could be solved by a clear definition and disambiguation of terms. In fact, such considerations have given rise to an entire ontology, a philosophy of existence. What we can truthfully say exists in the world is a metaphysical question, and many philosophers give a very simple answer to it: All that exists is the universe, the material that makes it up, and that's it—we just divide that material up in different ways.

- This might initially seem strange: Doesn't your TV exist? Doesn't your house exist? But when you think about it, this is just like the ship of Theseus example. There is no extra thing called your house above and beyond the material that makes it up. There's just material, and we describe it in a certain way.

- When we make a new object, all we're doing is rearranging preexisting matter into a new configuration, and when we destroy it, we are just arranging it in yet another way. We are not adding or subtracting anything to or from the universe. All that exists is the universe, and the parts of it can be arranged and described in different ways.

- In philosophy of mind, some say that the same thing is true of persons. Persons don't exist. It's not that there is not a collection of matter sitting wherever you are sitting—there is. It's just that, just like in the ship of Theseus, there is not some extra, separately existing, discrete thing called a person that exists in addition to that collection of matter. And that collection of matter is not a person itself. That collection of matter can be described in different ways in different scenarios, but it's all just description and convention. Because persons don't exist, there is no right or wrong answer.

- You might think this no-person, or no-self, view is a crazy one, but the truth is that philosophers and religious icons have been telling us this for centuries. Philosophers that argue for the no-self theory, like James Giles, are quick to point out that the words "I," "you," "self," and "person" are not meaningless or useless. This separates such philosophers from the eliminative materialists who thought that language about minds should be eliminated.

- Some might think that Descartes proved the existence of selves with his famous argument, "I think, therefore I am," but many argue that all that follows from his premise is that thinking exists. And "there is thinking, therefore there are thoughts" does not demonstrate the existence of a separately existing person.

- The no-self theory makes great sense of why all of our other theories have failed to answer our question about the survival of persons over time: It was a bad question to begin with because persons—at least as they are traditionally conceived, as single subjects of consciousness—don't exist. But despite the philosophical sense it makes, it still is a hard philosophical pill to swallow. Fortunately, we have one last theory to consider that also accounts for why our previous theories might have failed—why the question of personal identity is a bad question—and it doesn't deny the existence of persons.

Time Worms

- The time worm theory, developed by David Lewis, suggests that our questions about personal identity are bad not because persons don’t exist, but because we’ve been conceiving of persons in the wrong way. Lewis suggests that we should have been conceiving of persons like television shows—not as three-dimensional objects that exist at particular moments in time, but as four-dimensional objects stretched over a long period of time.

- So, asking whether you now and your eight-year-old self are the same person is like asking if two episodes of a show are the same show. Your eight-year-old self is not you; it’s just an episode of you. You now is not you; it’s just an episode of you. Lewis calls your episodes time slices. And a person just is a collection of time slices spread out over time: a time worm.

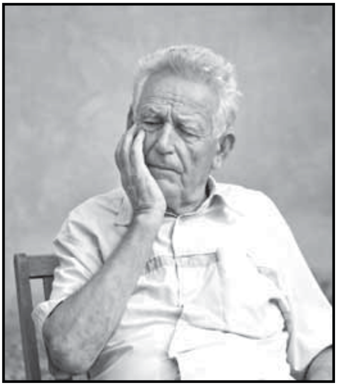
- So, what we should be asking is in virtue of what do you now and your eight-year-old self belong to the same time worm? And we could answer this question in ways that we’ve already suggested: by referring to a psychological or physical continuity that exists through the worm which you now and your eight-year-old self have in common.

- The nice thing about Lewis’s theory is that it can answer almost all of the thought experiment counterexamples that we have considered. When Spock transports down to the planet, his personal identity is preserved—or, more precisely, the person slice that appears on the planet belongs to the same time worm as the person slice that stepped into the transporter. And the same thing is true even if, when Spock beams back up, the matter of his original body is lost and the Enterprise transporter has to create a new body for him.

- So, persons are time worms, and time worms are sets of person time slices. But we have to be a little more precise, because anything can be a set. We could group together any person time slices we want—some from you, some from a stranger—and call them a set. But that wouldn't make them a time worm; that wouldn't be a person. We need criteria that determine what can belong to a particular time worm that would be considered a person, and what can't.

- Lewis suggests that a time worm that can be identified as a person is a set of person slices that is sufficiently continuous and that is maximally large—in other words, one that includes all of the sufficiently continuous slices there are. So, we couldn't only include your time slices from today because there are other sufficiently continuous slices that we could include to make the set larger.

- But this is where Lewis runs into a bit of a problem. Consider an Alzheimer's patient who goes completely senile in his last five years: He can't remember who he is, his family members, his past experiences—he's completely lost. What would constitute his time worm?



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If a man loses his mind before his death, should we say that he died when his body or his mind ceased to exist?

- We could include every slice from his physical birth to his physical death, but that would include his last five years. His psychological continuity was so broken in those years that the psychological continuity of the entire set would be quite low—for example, 50 percent. If we don't include those last five years in his time worm, then you wouldn't have the largest set possible, but it would be 100 percent psychologically continuous.

- So, what's more important: maximal size or psychological continuity? When should we say this person died—when his body physically died, or when his mind ceased to exist? As a physicalist, Lewis would likely prefer the maximal set, so he would say that it was when his physical body died. Lewis's theory gives us no way to answer this question, so at best his theory is incomplete.

- Lewis also would have a tough time accounting for how we should describe what could be considered spinoff persons. In television, a spinoff is a show that branches off from another show. For example, *Frasier* was a spinoff of *Cheers*. How should we divide up these television shows? Clearly, there are two sets, but do the episodes of the spinoff belong to the original series, or are they two entirely separate entities, with no overlap at all?

- We might have to worry about these questions with persons in the near future. Suppose that one day you are cloned. Clearly, this creates a new time worm, but does that time worm share your original time slices from before you were cloned? Suppose that you are duplicated, creating a physically separate but psychologically continuous person—would that person share your previous time slices? Again, although Lewis might prefer one answer over another, Lewis's theory gives no way to answer these questions, and therefore seems inadequate.

- But Lewis's theory also has a few other unintuitive consequences. For example, how many persons are in your house right now? Regardless of how many bodies there actually are, if Lewis is right, then everyone should answer this question in every circumstance with the same answer: zero. Persons do not exist at any particular location at any particular point in time—person slices do. Persons are four-dimensional objects stretched out over time; they cannot be in a house at a particular time. So, the answer to how many people there are in any particular location will always be zero.

- Lewis would probably argue that this is no more unintuitive than the realization that you can't watch an entire television show by staring at your screen for one second. Persons, like shows, simply don't exist in that way.

- But Lewis's theory also has this strange consequence: It seems to entail that persons don't exist until they die. If persons are time worms, maximally large continuous sets of person slices, then they don't exist until the set is complete—until it is fully maximal. But your time worm will not be complete until you die, so you won't exist until you die.

- Or, worse yet, you might never exist. Some philosophers think that all that truly exists is the present moment; the past did exist, and the future will exist, but neither currently exists. So, it's never the case that anyone's time worm actually fully exists in its entirety—so, at least in this view of time, persons never exist.

Suggested Reading

Giles, "The No-Self Theory."

Hume, *An Enquiry Concerning Human Understanding*.

———, *Treatise on Human Nature*.

"Identity and Non-Identity," Part LIII in *The Gospel of Buddha*.

Nagel, "Brain Bisection and the Unity of Consciousness."

Parfit, "Divided Minds and the Nature of Persons."

Weatherson, "David Lewis."

Questions to Consider

1. How important or essential is it to believe that persons exist? If we came to believe that persons didn't exist, how would society change?

2. David Lewis's time worm theory suggests that persons are like television shows; they exist stretched over time. But do television shows have positive ontological status? In other words, do they really exist like persons supposedly exist, or is it really just a matter of how we describe the world, like it was with Theseus's ship? How might your answer to these questions affect your conclusion about whether or not persons exist?

The Nature of Truth and Time

Lecture 10

David Lewis suggested that persons are time worms: Persons don't exist at a particular moment in time, but instead as a collection of person slices stretched out over time. However, because your time worm won't be complete until your life is over, this has the odd consequence of entailing that persons don't exist until they die—that is, unless you believe that the future events of your life exist before they occur. But how could that be true? And what could that even mean? This gives rise to questions about the very nature of time, and it is such questions that this lecture will address.

Theological Fatalism

- A problem related to time that is important to theologians and philosophers of religion is the problem of human freedom and divine foreknowledge. In a nutshell, the problem is this: How is it that we can freely choose to do what we do if God knew beforehand that we were going to do it?

- It seems fairly intuitive that for you to freely choose to do some particular action, it must also be possible for you to not choose that action. If it's not even possible for you to not, for example, eat pizza for lunch at noon tomorrow, then you can't do it freely. This is called the libertarian definition of free will. Often, it is expressed like this: Free will requires alternate possibilities.

- If God exists, he or she would supposedly be perfect—which means that he or she could never be wrong and would know everything, including what will happen before it happens. But suppose God believed yesterday that you would choose to have pizza at noon for lunch tomorrow. Would it be possible for you to not choose to have pizza at noon for lunch tomorrow?

- It doesn't seem so. If you don't choose to eat pizza, then you would make the belief that God had yesterday false, and that can't happen—God can't have false beliefs. The only way you could not choose to eat pizza would be by somehow changing the belief that God had yesterday. But you can't do that either; you can't change the past. Once something has occurred, it occurred. Once God has believed what he or she has believed, you can't undo the fact that he or she believed it.

- But if you can't fail to choose pizza for lunch tomorrow, then you cannot do so freely. Free will requires alternate possibilities. So, it seems that the assumption that God has foreknowledge of the future is incompatible with the notion that humans have free will. That is the freedom and foreknowledge problem.

- Divine foreknowledge is incompatible with human free will not because the existence of God's foreknowledge somehow interferes with our ability to choose, but because the assumption that God has foreknowledge entails that the future must exist before it occurs—it must be there for God to know about—and if the future exists before it occurs, then we can't be free. There are no other possibilities. In short, we can say that foreknowledge is incompatible with free will because it entails a temporal ontology—a view about which times exist—that is incompatible with free will.

- This exposes why suggesting that God is timeless—that God exists outside of the entire time line of past, present, and future and knows it as a whole—doesn't resolve the theological fatalism dilemma either. Suggesting that there is a time line for God to exist "outside of" reinforces the idea that the entire time line, including the future, exists and thus reinforces the temporal ontology that is incompatible with free will.

- Some might try to avoid the problem by suggesting that the future is changeable. However, although this is a popular device in science-fiction movies, the notion that the future is changeable is actually logically incoherent. It implies that it was true that some future event was going to occur, but you did something and now it won't occur.

- So, God’s foreknowledge would entail a temporal ontology—a view of time—that is incompatible with free will. To avoid this consequence, some philosophers, called open theists, have denied that God has foreknowledge; consequently, they can avoid being committed to this view of time.

Logical Fatalism

- What is time really like? What is the correct temporal ontology? Are there other reasons besides God’s foreknowledge to think that the future exists before it occurs? In fact, there is. Understanding why helps us understand the nature of time, and even the nature of truth, and what truly lies at the root of the freedom foreknowledge problem.

- Take the following proposition: The bottle is on the table. What makes that proposition true? Its truth can’t be without explanation; there is a reason that proposition is true, rather than false. So, in virtue of what is that proposition true? The obvious answer is this: the bottle being on the table. There is a state of affairs in the world—an actual piece of the world—in which there is a bottle, and a table, and the bottle is on that table. That physical state of affairs in the world is what makes the proposition true. Philosophers would call that state of affairs the proposition’s truthmaker—it’s what makes the proposition true.

- This idea points to the nature of truth and is in line with the most well-accepted theory of truth: the correspondence theory, which states that propositions are true in virtue of their correspondence to the way the world is. Simply put, a proposition is true if it accurately describes the world.

- There actually are other theories of truth, but none are well accepted. Some have suggested that coherence can determine truth: If a set of propositions is coherent, then it is true. However, although coherence is required for truth, coherence is not sufficient for truth. After all, *The Lord of the Rings* is a coherent story, but it is not true. Others have suggested that truth can be found in pragmatism: If something is useful, then it is true. However, again, this doesn’t

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Propositions about the past—for example, about dinosaurs roaming the Earth—presently have a truth-value.

seem right. Newton's view of physics was very useful, but it was proven false by Einstein.

- So, according to the correspondence theory of truth, the most popular and intuitive theory of truth, every proposition must have a truthmaker. But here's an interesting question: What would be the truthmaker for a proposition about the past? For example, it is presently true that dinosaurs once roamed the Earth, so what makes the proposition "dinosaurs once roamed the Earth" true?

- You might say that the dinosaur fossils we have found in the ground make it true, but that's how we know that it is true—that's not what makes it true. Even if no dinosaurs ever died in a circumstance in which their bones would be fossilized, and thus we had no fossil record of them, it would still be true that dinosaurs once roamed the Earth. After all, you can't make it true that an event never occurred by erasing all evidence of it. So, again, what is the truthmaker for that proposition about the past?

- The most obvious answer is this: What makes it presently true that dinosaurs once roamed the Earth? The past event of dinosaurs roaming the Earth. But how can past events determine the truth-value of a proposition that is currently true? If the proposition were presently true, wouldn't that event have to presently exist? A truthmaker can't make something true unless it exists, right? After all, if we take the bottle off of the table, and thus the state of affairs of the bottle being on the table no longer exists, then it is no longer true that the bottle is on the table.

- So, if the past event of dinosaurs roaming the Earth is what makes it presently true that dinosaurs once roamed the Earth, then the past event of dinosaurs roaming the Earth must exist. It's not presently occurring, but the events must in some sense exist. We have to include them in our temporal ontology. Otherwise, propositions about the past have no truthmaker.

- But the exact same thing would follow about propositions regarding the future. Just like propositions about the past, propositions about the future also presently have a truth-value. Thus, we need presently existing truthmakers for them. But what else could serve as the truthmaker for a proposition about the future except the future event to which it refers? So, we must include the future in our temporal ontology, too. If it is true that you will eat pizza for lunch at noon tomorrow, then the event of you eating pizza for lunch at noon tomorrow must already exist—it must already be written on the time line. It's not occurring, but it exists.

- And because a temporal ontology that includes an already existing future is incompatible with free will, the mere fact that there are true propositions about the future entails that we cannot be free. In fact, because it seems obvious that there are presently true propositions about the entire past and the entire future, even if we don't know which ones are true or false, it seems that we are committed to believing that all moments in time exist.

- The fact that there are true propositions about the future is enough to threaten free will. And that means it's not even God's foreknowledge that is incompatible with free will; the mere possibility of God's foreknowledge is incompatible with free will. Even if God didn't exist, if there are truths about the future, then it would be possible for God to have foreknowledge if he or she existed—but, of course, if there are true propositions about the future, we cannot be free.

Avoiding the Future

- To get this problem and rescue human free will, it seems that we're going to have to deny that there are truths about the future. The problem with this suggestion is that it denies one of the three fundamental axioms of logic, fundamental axioms that underline every branch of science, mathematics, and philosophy—basically all of human knowledge. And that assumption is that every proposition has a truth-value. Every proposition is either true, or it's false, in which case, its negation is true. And if you deny this rule, not only does all of logic and reasoning fall apart, but it also has really strange results.

- It seems obviously true—in fact, it must be true, because it's a tautology—to say that either you will eat pizza for lunch tomorrow, or you won't. Not only is it obviously true that if you do eat pizza tomorrow, it was true today that you would, but also it seems undeniably true that you either will or you won't.

- But that it seems crazy doesn't mean that some people haven't tried to deny this fundamental axiom of logic. To do so, you would have to rewrite our entire logical system—rethink the very way that we reason. And this is exactly what some people have done. Many multivalued logics have been proposed, but none have been fully developed in a way that avoids very troubling objections. But even if you embrace a multivalued logic, the notion of human free will still faces some grandiose threats.

Suggested Reading

Alston, "Divine Foreknowledge and Alternative Conceptions of Human Freedom."

Armstrong, *Truth and Truthmakers.*

Bernstein, "Fatalism."

Bourne, "Future Contingents, Non-Contradiction and the Law of Excluded Middle."

Crisp, "Presentism."

Dummett, *Truth and the Past.*

Freddoso, "Accidental Necessity and Power over the Past."

Fischer, ed, *God, Freedom, and Foreknowledge*.

Johnson, "God, Fatalism, and Temporal Ontology."

Keller, "Presentism and Truthmaking."

Lewis, "Survival and Identity."

Merricks, "Good-Bye Growing Block."

Molina, *On Divine Foreknowledge.*

Newhard, "The Correspondence Intuition."

Oaklander, *The Ontology of Time.*

Pike, "Divine Omniscience and Voluntary Action."

Pinnock, Rice, Sanders, Hasker, and Basinger, *The Openness of God*.

Plantinga, *God, Freedom and Evil.*

Rea, "Four-Dimensionalism."

Rhoda, Boyd, and Belt, "Open Theism, Omniscience, and the Nature of the Future."

Rice, "Trinity, Temporality, and Open Theism."

Rogers, "The Necessity of the Present and Anselm's Eternalist Response to the Problem of Theological Fatalism."

Schmidtt, *Theories of Truth.*

Sider, *Four-Dimensionalism*.

Tuggy, "Three Roads to Open Theism."

Widerker, “Two Forms of Fatalism.”

William of Ockham, translated by Adams and Kretzmann.

Questions to Consider

1. Knowledge is classically defined by philosophers as “justified true belief.” Foreknowledge is knowledge of the future before it happens. As we’ve seen, it seems that divine foreknowledge is incompatible with free will. However, given the arguments that we have considered this lecture, is human foreknowledge incompatible with free will as well?

2. Suppose that you found a book that was the collection of all the true propositions about your life arranged in chronological order. Would you read it? Would you skip parts? Would you read the end? Why, or why not?

Libertarian Free Will

Lecture 11

In this lecture, you will learn how a certain view of time—a temporal ontology—that includes an already written future threatens free will. Keep in mind that the kind of free will that we are talking about is not political freedom. We have more or less political freedom depending on what laws are on the book, but that kind of freedom is the concern of the political philosopher, not the metaphysician. The human free will that the metaphysician is concerned about is your ability to choose the actions you choose.

Libertarian Free Will

- Free will is difficult to define, but we do have some pretty strong intuitions regarding what is required to possess it. For example, it seems clear that you cannot freely choose to do something if it is not possible for you to choose any other thing. The freedom to choose requires alternate possibilities. This intuition seems obvious given that this is the very assumption we make when we are deciding which choice to make.

- This is the libertarian requirement for free will. Again, don't think of it in political terms. In metaphysics, the libertarian definition of freedom suggests that free will requires alternate possibilities.

- There is actually a wealth of literature on this topic, and the libertarian notion of free will has undergone significant nuanced revisions. Usually, the libertarian notion of free will is defined in terms of alternate choice. In order to freely choose to do something, it must be possible for you to not choose to do that thing.

- We've already considered one reason to think that we are not free—that there are no alternate possibilities. If the future exists before it occurs, then the future is already written, and we can choose to do no other action besides those that are already written on the time

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There are several reasons to think that we don't actually have free will, even though we might feel like we do.

line. But maybe you are not impressed with this argument; maybe you're willing to embrace multivalued logic. Still, there are other reasons for concluding that we don't have free will.

Determinism and Randomness

- A deterministic system is one in which all events that occur are dictated by the laws of physics, and what they entail must occur given a previous state of affairs. A billiard table is a deterministic system. Let's say that you've racked up the billiard balls, and you hit the cue ball toward them. What will happen next is completely and totally determined by the laws of physics; the velocity and spin of the ball, the location and mass of the other balls, and the size of the table all determine what will occur. In fact, if you knew all of this information, and were really good at math, you could actually figure out what's going to happen before it occurs.

- Looking at it, it would seem random, but it's only because we can't intuitively do such calculations by simply looking, and most of the nuanced information that would be required is not available to us.

But if we knew everything about the billiard table and the laws of physics, and we were fast enough, then we could figure it out.

- One hallmark of a deterministic system is that if it is reset, it repeats. Put the balls in the exact same configuration, hit the cue ball from the same location in exactly the same way, and you will get the same result.

- The determinist is someone who believes that the universe is a deterministic system. Think of the universe's fundamental particles—like protons, electrons, and photons—as the billiard balls and the universe as a giant three-dimensional pool table on which these particles interact with each other. How these particles interact with one another is completely governed and determined by the laws of physics, and everything that happens in the universe is ultimately just the movement of such particles.

- So, if we knew the location and velocity and spin of all the particles in the universe right now, we could just do the math and figure out where all the particles will be in the next moment in time. We could figure out the entire future. In fact, if the universe is deterministic, if we knew what the universe was like the moment after the big bang, we could figure out the entire history of the universe.

- To understand why and how this view of the universe threatens free will, you need to appreciate that you are made up of material particles—your actions are the movements of matter in the universe. And you do not violate the physical laws. We could trace the causes of the movement of the particles of your brain all the way back to the big bang, but obviously, you had no control over what occurred then, so you have no control over what you do now.

- Perhaps we can fully appreciate how a deterministic view of the universe threatens free will by realizing that if it is a deterministic system, it is repeatable. If you set things up exactly as they were set up before—if the big bang happened again just as before—then the universe would unfold exactly as it had before. So, clearly, nothing else but what is causally determined by the initial state of the universe, including your actions, could occur. So, clearly, you can't do otherwise, and thus you are not free.

- The deterministic view of the universe was very popular among scientists more than a century and a half ago, because it had the most evidence at the time. But it turns out that this view has faults. What proved determinism false was quantum mechanics.

- Random, uncaused events are no more free than determined ones. So, our current view of the universe as dictated by quantum mechanics, even though it falsifies a deterministic view of the universe, is just as much a threat to free will as determinism.

- Ultimately, it seems that in order for you to have free will, your actions must be up to you. But they are not up to you if they are determined or if they are random. For this reason, a lot of people try to defend the soul hypothesis in order to defend the notion of free will. It seems that only if our soul is magically reaching out from beyond the physical world to determine what actions we take are we really free. But we've already encountered the problems with the soul hypothesis. We know that all our mental events, including the decisions we make, are a result of the neural activity of our brains.

Neuroscience

- The second threat to free will is what we have learned from neuroscience. The human limbic system, the origin of all our emotions, is constantly sending signals to our frontal cortex, the rational decision centers of our brain, telling it what to do. The cortex can inhibit those signals to some degree, but the number of connections running from the limbic system to the cortex is far greater than the number of connections running back down from the cortex to the limbic system. There's not much it can do. Mainly, what it does is follow the limbic system's suggestions and then go through a process of rationalization to convince itself that is what it wanted to do in the first place.

- But it's not like the structure of our brain is within our control. Most of that structure is due to our genetics, and that is not within our control. But the rest of the structure is a result of our environment—how we are taught, the things we experience, etc. And that's not within our control either.

- You might think that we can control our environment by choosing what situations to place ourselves in, but that just backs up the problem. The choices we make about our environment are just a result of our brain structure, which again is either a product of genetics or environment. Tracing it back, you will ultimately get to environments that you had no control over, like the environment you find yourself in as a baby, and you will realize you actually have no free will.

- But maybe you think that the decision centers of our brain, the parts that actually give rise to the conscious experience of making a decision, can produce true free decisions—perhaps somehow their complexity preserves free will. But neuroscience has even deflated that notion.

- In the 1960s, the neuroscientists Hans Helmut Kornhuber and Lüder Deecke discovered that if you measure brain activity before a decision occurs, you can actually see the processes that lead to the decision being made—and, it turns out, they happen before the decision is consciously made and have nothing to do with the part of the brain responsible for conscious decisions. They called it a readiness potential. And since then, their findings have been repeated, supported, and reiterated in many ways.

- Then, in 2008, psychologist John-Dylan Haynes performed an experiment in which people decided which button to push while watching a series of letters being displayed and reported what letter was displayed while making their decision. Haynes found that unconscious parts of the brain were busy doing their work to bring about the eventual action seconds before the reported letter appeared—long before the conscious decision was made. In his own experiments, neuroscientist Itzhak Fried was even able to predict the conscious decision before it was made with 80 to 90 percent accuracy.

- Even if you are not bothered by determinism, or quantum randomness, or even that our actions are determined by the structure of our brain—if you think you are free—you've got to think that your conscious decisions play a causal role in the actions that you make. You've got to think that when your free will is exercised, you are consciously making a decision—your consciousness is involved in decision making. Even if you're an epiphenomenalist and you don't think that mental events have any causal effect on the world, you've got to think that the part of your brain that gives rise to conscious decisions has to be the cause of your actions, at least if you're going to be free.

- But what these experiments seem to indicate is that your conscious decision is an afterthought. The real decision process is done by unconscious parts of the brain, and once they have done their work, they send a signal to the consciousness-producing part of the brain that gives you the conscious experience of making the decision. But the brain activity that produces that experience, or the parts of the brain that produce them, are not playing a role in determining what action you will take. The brain is creating the illusion of free will. Ultimately, the results of these experiments are challenged by some scientists, and more experiments need to be done.

Suggested Reading

Carter, *Mapping the Mind*, Chap. 3.

Clarke and Capes, "Incompatibilist (Nondeterministic) Theories of Free Will."

Dvorsky, "Scientific Evidence That You Probably Don't Have Free Will."

Fischer, *The Metaphysics of Free Will*.

Frankfurt, "Alternate Possibilities and Moral Responsibility."

Gazzaniga, *The Mind's Past*.

———, *Who's In Charge?*

Kane, *A Contemporary Introduction to Free Will.*

———, "Free Will."

Kane, ed, *Free Will.*

Laplace, "*Essai philosophique sur les probabilities*."

Penrose, *The Emperor's New Mind*.

Speak, "Fanning the Flickers of Freedom."

Van Inwagen, "The Incompatibility of Free Will and Determinism."

Wyma, "Moral Responsibility and the Leeway for Action."

Zagzebski, "Recent Work on Divine Foreknowledge and Free Will."

———, *The Dilemma of Freedom and Foreknowledge.*

Questions to Consider

1. Does human free will really require the ability to choose to not act as you act? Can you think of a situation where someone could act freely yet where not choosing to act as he or she does is not possible?

2. In the movie *The Matrix*, artificially intelligent machines build a virtual world for humans and restart it every 100 years. And every time, it turns out the same way: The same things happen; the humans do all the same things. If we rewound our world 100 years, would the same things happen? What if we rewound it to the moment you were born? Would you end up doing exactly as you did before—living the same life? Remember, you wouldn't know anything that you do now; you would be starting from scratch again. What does your answer reveal about your beliefs regarding free will?

3. Suppose that all the decisions we make in our life are ultimately the result of the work of unconscious parts of our brains. Can it still be that humans have free will?

Compatibilistic Freedom

Lecture 12

Not only are certain temporal ontologies incompatible with free will, but the very nature of the universe seems to be as well. In addition, not only do our decisions seem to simply be a result of our brain structure, which is outside of our control, but also neuroscientific research seems to suggest that our actions are actually brought about by unconscious processes in our brain that happen before our conscious decisions occur. But could it be that even though we don't have libertarian free will, we are still free in another way—perhaps even a more important way? This is the suggestion of the compatibilists.

Compatibilism

- The reason that free will is usually thought to be of philosophical significance is because it seems to be required for moral responsibility. You can only be morally responsible for doing something if you freely choose to do it. Libertarians suggest that free will requires alternate possibilities, but compatibilists suggest that this may not be the case because moral responsibility may not really require alternate possibilities. If freedom is required for moral responsibility, but moral responsibility doesn't require alternate possibilities, then freedom doesn't require alternate possibilities.

- The compatibilists' notion of freedom doesn't require alternate possibilities. The basic idea is this: As long as your actions flow out of your wants and desires, then you are said to be acting freely. If you want to do something, and your action of doing it is caused by your wanting to do it, then you are doing it freely—you could be held morally responsible or praiseworthy for doing it. Notice that this can be true (you can act on your wants and desires) even if you couldn't do or choose to do anything else. So, according to the compatibilists, you can be free and even morally responsible even if you can't choose to do otherwise.

- For simplicity's sake, let's reserve the word "freedom" for the compatibilists' notion and the words "free will" for the libertarian notion. So, the compatibilists would admit that we humans don't have free will—in the sense that we can do otherwise—but humans do possess freedom: They can act according to their wants and desires and can be held morally responsible for doing so.

- However, this articulation of what compatibilists say is required for freedom is a bit simplistic. After all, chain-smokers desire cigarettes, but when they smoke one, it's not necessarily the case that they are acting freely. This has caused compatibilists to make further modifications to their theory.

- Chain-smokers may desire their next cigarette, but they also may desire to no longer have such desires. They may have second-order desires—desires about their desires. Some compatibilists have suggested that we think of freedom in terms of acting in accordance with your second-order wants and desires. So, chain-smokers who want to quit don't freely choose to smoke each cigarette because, even though they desire a cigarette, their action is not in line with their second-order desire to not want or smoke cigarettes anymore. But they can truly show that they are free by choosing not to smoke, despite their first-order desire to do so.

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When chain-smokers smoke a cigarette, they are not necessarily acting freely.

- Other compatibilists have identified other components of our psychology that may drive our behavior and have argued that we possess freedom when we act in accordance with them. For example, John Martin Fischer has developed a version that defines freedom in terms of responsiveness to reason;

roughly put, if a decision is reached as a process of reasonable deliberation, the action is said to be free.

- The compatibilists' definition of free will has many advantages, not the least of which is that, unlike libertarian free will, a decent case can be made that humans actually possess this kind of freedom. For example, humans possessing this kind of freedom is compatible with determinism. In fact, that's where compatibilism gets its name. Even if it is the case that every event in the universe is determined by prior causes, including all the events in your brain and your bodily actions, it can still be the case that you act in accordance with your wants and desires, or your second-order wants and desires.

- Or, it can still be the case that you do what you do as the result of a reasonable deliberation. You may have been determined by prior physical events in the universe to have the wants and desires you have, or even to go through the reasonable deliberation process that you did, but that doesn't matter for the compatibilists. All that matters is what drives your actions; if they are appropriately driven, then they are free and you are morally responsible for them.

- It's less clear if and when compatibilism is consistent with indeterminism. If a random quantum event happens in your brain and causes you to have a certain desire, and then you act according to that desire, according to the compatibilists, you are free. You acted in accordance with your desire.

- But if you do the action you do merely because a certain quantum event happens in your brain, then you're not acting freely, according to the compatibilists. And this is true even if you happen to act in accordance with a desire that you happen to have. According to compatibilism, your actions have to be driven by your wants and desires; they can't just happen to randomly correspond to them.

- However, until more research on the brain determines the exact role that quantum indeterminacy has on our actions—if it has any at all—it will be unclear as to whether indeterminism is consistent with compatibilistic freedom. What about neuroscientific experiments that seem to show that it is unconscious brain processes that cause our behavior, instead of our conscious decisions? Is compatibilistic human freedom possible if that is true? Again, it's not clear—more research and argument is needed.

Agent-Causation

- The biggest problem with compatibilism is that it just doesn't match our intuitions. Humans may have freedom by this definition, but the compatibilists' definition does not seem to track what everyone means when they say that humans are free. When people believe that humans are free, they believe that, ultimately, how they behave is up to them. Nothing else is the cause of the agent's action; the agent, himself or herself, is the ultimate cause.

- This intuition has given rise to another libertarian theory of free will: agent-causation. The basic idea is that in order for an action to be free, the causal story of why the action occurred has to end in the agent that performed the action. Most agent-causation theorists think that if it is true that the agent is the ultimate cause of the action, then it must be possible for the agent to do otherwise. This is why agent theorists are libertarians. Notice that in a compatibilist's definition, the agent could fail to be the ultimate cause of his or her actions and yet still possess freedom.

- It might seem outlandish for someone's wants and desires to come from the outside, but if the universe is deterministic, then this would actually be quite common. The wants and desires you have are the result of your brain structure, and you really don't have control over that. Your brain structure is a result of your DNA and environment, both of which are ultimately out of your control.

- And this is true whether you think that freedom requires you to act because of second-order wants and desires or rational deliberation—whatever it is, it will be the result of your neural structure. But, ultimately, your neural structure is beyond your control. We may be free on the compatibilists' definition of freedom, but the compatibilists' definition is not what most people have in mind when they believe that humans are free.

- So, we have now considered three reasons for concluding that humans don't possess free will: the problem of temporal ontology, the problem of determinism and indeterminism, and the problems presented by neuroscience. If compatibilists are right about what is required for humans to be free, these things may not pose that much of a threat—but it seems unlikely that the compatibilists' definition reflects what most people believe when they believe that humans are free.

What If Free Will Is a Fiction?

- If free will is a fiction—what next? This seems big, and if true, it would seem to completely change the world. And it might. The legal ramifications themselves are quite dramatic; the admission that humans don't have free will would completely change our entire justice system.

- However, the thing is that the admission might never come. Not only might the philosophical book on free will never be closed—some philosophers still argue about it vehemently—but even if it is philosophically undeniable that we do not possess free will, it seems unlikely that we will ever cease feeling free. The notion that we have free will is so ingrained in us that it seems that no philosophical argument could dislodge it, at least on a day-to-day basis.

- We have no choice; we are not free. Ultimately, we do not have control of our actions, desires, or beliefs. And one thing we can't help but believe is true is that we have free will. So, what's the point of trying to figure out whether or not we have free will if we can't help but believe that we do? The answer comes in our ability to separate personal feelings from academic philosophical conclusions, being able to separate what we know is true and what we feel is true, and being able to act accordingly in the relevant situations.

- For example, once we academically realize that humans have no free will, we will have to repurpose our prison system. Regardless of how free we feel, and even how we feel about those who commit crimes, an argument that criminals freely choose to do their crimes, and are thus morally responsible, would have no legs to stand on. But the academic realization that we are not free in the metaphysical sense would not be a reason to restrict our freedom in the political sense—for restricting liberty. Even if we can't do otherwise, it doesn't follow that we should be restricted by law from doing otherwise.

- The academic realization that there is no free will might be hard on religion. Religions usually assume that we are personally morally responsible for our actions and that we will somehow reap the rewards or punishments for our moral behavior. And, philosophically, that may not make much sense. On the other hand, the personal feeling of moral responsibility likely isn't going anywhere—in the same way that our feeling that we are free isn't going away—and that may be enough to keep religion afloat.

Suggested Reading

Burgess, *A Clockwork Orange.*

Fischer and Ravizza, *Responsibility and Control*.

Fischer, "Frankfurt-Type Examples and Semi-Compatibilism."

———, "Responsiveness and Moral Responsibility."

Ginet, "In Defense of the Principle of Alternate Possibilities."

Kane, *A Contemporary Introduction to Free Will.*

Kane, ed, *Free Will.*

———, *The Oxford Handbook of Free Will.*

Markosian, "A Compatibilist Version of the Theory of Agent Causation."

McKenna, "Compatibilism."

Mele and Robb, “Rescuing Frankfurt-Style Cases.”

Nielsen, Dennett, Fischer, Pereboom, and Frankfurt, *Free Will*.

Questions to Consider

1. Some libertarians hold to this definition of free will: In order to freely choose to do something, it must be possible for you to not choose to do that thing. Can you think of the counterexample to this principle? Can you think of a situation where someone acts freely, yet it is not possible for that person to not choose to do the action he or she does?

2. Agent-causation theorists suggest that an action is free only if the ultimate cause of that action is the agent who performed it. If you were to trace the causal history of that action, it must end in the agent. Is it possible for an action to be agent-caused and yet for it to be true that the agent couldn’t have done anything else?

3. Is it possible for you to believe that you don’t have free will?

4. What other ways would the world be different if we, at least academically and philosophically, admitted that we have no free will?

Causation, Possible Worlds, and Propositions

Lecture 13

The subject of this lecture is the nature of reality—the nature of the universe and that which may or may not exist outside of it. As you explore the concept of causation, you will be exposed to many reasons for thinking that possible worlds exist, and you will be introduced to the concept of an abstract object. Suggesting that such things exist isn't crazy; in fact, these concepts are very philosophically useful.

Hume and Causation

- What does it mean that to suggest that one thing, A, is the cause of some other thing B? You can't merely mean that A comes right before B; there are plenty of examples of one thing following the other where the two things are not causally related. But even if there were a correlation, that would not necessarily imply a causal connection.

- The causal fallacy is a logical fallacy: Correlation does not necessarily imply causation. Sometimes the correlation is due not to causation, but to a common third factor. But sometimes it's just coincidence. So, when we say that two things are causally related, we can't merely mean that one came before the other or that they are correlated. So, what does causation amount to?

- The philosopher David Hume suggested that a causal relation between two things amounted to a necessary connection between those two things. The presence of one would guarantee the presence of the other. That would mean that not only is it the case that every time A has occurred B followed, but every time A will occur B will occur.

- But how could we know that two events are necessarily connected in this way? A necessary connection is not a thing that we can observe; all we can see with our eyes is a correlation. We cannot look into the future to see whether or not every time A will occur B will occur.

- You might think that we can know that B will always follow A because B always has followed A. However, Hume points out, such an inference relies on induction, a method of reasoning that infers what the future will be like from what the past was like. Hume points out that we cannot prove that such reasoning is reliable. Any argument we gave in its favor would have to utilize the fact that such reasoning has worked in the past and from that conclude that it will work in the future. But such an argument utilizes the very method of reasoning that it's trying to prove and, thus, is no good. It just argues in a circle. This is Hume's famous problem of induction.

Modal Statements and Possible Worlds

- Statements about possibility and necessity are called modal statements. Their truth is controversial. Consider the following statement: Mitt Romney could have won the 2012 election. We think that this statement is true. We can no longer change the past, but the state of affairs of Romney winning the 2012 election is a possible state of affairs. But what makes that true?

- The correspondence theory of truth requires the truth of propositions to have an explanation—to have a truthmaker. The fact that Barack Obama won the 2012 election does have a truthmaker: the past event of Obama winning the election. But what makes it true that Romney could have won the election? Because Romney did not win the election in the real world, it doesn't seem that we can point to any state of affairs in the real world to find a truthmaker for this modal statement.

- We might say that it's true because if people had voted differently, he would have won. But that only follows if people could have voted differently than they did. Was such a thing possible? So, that leads us right back to wondering about modal statements.

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If people had voted differently in the 2012 election, then Mitt Romney would have won—but could people have voted differently than they did?

- To answer these questions about modal statements, philosophers introduced the notion of possible worlds. A possible world represents a different way that all of reality could have gone. So, imagine a universe that is exactly like ours, except there is one difference: your shirt is a different color. That is a possible world. Imagine a universe where two things are different: your shirt is a different color, and you're not wearing shoes. That is a possible world. For any given way that the universe could have gone, there is a possible world in which it went that way.

- Possible worlds are not merely alternate universes. Possible worlds are descriptions of an entire reality, not just a universe. Some possible worlds consist of one universe, and some possible worlds are multiverses, so we can't think of possible worlds merely as alternate universes.

- What philosophers suggest that modal statements amount to are statements about possible worlds. "Romney could have won the

2012 election" just means "there is a possible world in which Romney won the 2012 election." "People could have voted differently" amounts to "there is a possible world in which people did vote differently."

- Recall that we are looking for truthmakers for modal statements. So, if possible worlds are going to serve as truthmakers for modal statements, must they exist like states of affairs exist? The philosopher David Lewis suggests that they must. If we think that something serves as a truthmaker for a proposition, we must include it in our ontology—we must think that it exists.

- When we discussed including future and past events in our ontology, we drew a distinction between their existence and their occurrence. The fact that you are committed to believing that a future event exists does not commit you to believing that it is presently occurring. Lewis suggests that, when it comes to possible worlds, we draw a distinction between existence and being actual. The fact that a possible world exists does not mean that it is actual; the only possible world that we can say is actual is our own. The other worlds exist, but are merely possible.

- Some philosophers stop there, but David Lewis goes further. He suggests that those other worlds are just as real as our own. They have an equal ontological status to our own. Sure, they are merely possible. But to the beings in those worlds, our world is merely possible. To them, their world is actual—at least according to Lewis. He is a realist about possible worlds.

- Not all philosophers are friendly to this idea. Because there is an infinite number of ways the world could have turned out, there would be an infinite number of possible worlds. Philosophers don't like to suppose that things exist when they don't have to, and an infinite number of possible worlds is a lot of things to suppose exist. However, possible-world semantics is a very useful way to make sense of modal statements, and there are a number of attempts to preserve its meaning without such a bloated ontology.

Propositions and Universals

- A proposition is not the same thing as a sentence; sentences express propositions, but they are not identical to propositions. Propositions have truth-values, and they are either true or false in virtue of whether or not they describe the world. Some propositions are never expressed. How can something have a truth-value and describe the world if it does not exist in some sense? You can't find propositions in the world. So, if propositions exist, but are not in the world, then what are they?

- It is problems like this that have driven philosophers to think of propositions as abstract objects—nonphysical entities. Like souls, they are not made of matter, but unlike souls, they are not made of anything else—they are not as substance—and they do not causally influence the world. So, no weird problems of downward causation emerge, like they did with souls. But still, the idea of abstract objects is a bit strange.

- But it's not a new idea. The first abstract objects were most likely hypothesized by Plato, who wondered how it could be that two different objects with extremely different properties could be the same type of thing. Modern philosophers still debate about such things, but in a slightly different way. The nature of properties is of considerable interest.

- We don't want to deny that colors are real, but how can the same color be two places at once? No individual entity that exists in the universe can be two places at once, so, some philosophers argue, colors must not be individual entities that exist in the universe. They must be like forms, nonphysical abstract entities that exist outside the universe but can be possessed by individuals in the universe. This would be true for any property. Philosophers call such entities universals.

- Although you can see when an individual possesses a property, the universal itself is unobservable. Some philosophers think that the existence of universals is the best way to resolve philosophical problems; thus, they have no problem hypothesizing their existence. A realist theory of universals suggests that universals actually exist.

- Some philosophers don't agree. They don't like hypothesizing the existence of strange abstract entities and think that philosophical problems can be solved without them. Some philosophers want to account for properties by grouping objects into sets, where all the members of the set resemble each other. But of course, it's difficult to account for resemblance without reference to properties.

Propositions and Possible Worlds

- Some philosophers think of propositions as abstract objects. But if we are articulating our ontology—our list of everything that exists—we would have to include any abstract objects that we believe exist. So, if you believe that propositions are abstract objects, then you would have to include them in your ontology.

- Some philosophers don't like the idea of possible worlds being real, existent objects; they didn't want to include them in their ontology. They thought that it made their ontology too bloated. But if a possible world is a logically consistent arrangement of all propositions, and propositions are abstract objects, and you have to include abstract objects in your ontology, then it's not clear that conceiving of possible worlds as sets of propositions solves anything.

- It still gives us a bloated ontology. Some might argue that having abstract objects, like propositions, in your ontology is not as bad as having entire possible worlds in your ontology. Some philosophers go the opposite direction and try to eliminate propositions from their ontology by using possible worlds. They suggest that a proposition is just the set of all the possible worlds in which it is true.

Back to Causation

- Regardless, it's undeniable that possible worlds solve all kinds of philosophical problems, which is at least some reason for thinking that they exist. David Lewis suggests that possible worlds can very easily solve the philosophical problems that surround causation.

- According to Lewis, an event A causes an event B when it is the case that a world where A doesn't occur but B still occurs is radically different from our own, compared to a world where neither occur. Notice that this also makes sense of why two things are not causally related. But Lewis's theory has been subjected to objections.

Suggested Reading

"Correlation Does Not Imply Causation," *Rational Wiki.*

Divers, *Possible Worlds*.

Girle, *Modal Logics and Philosophy.*

———, *Possible Worlds.*

Hoffman, "Are Propositions Sets of Possible Worlds?"

Hume, *Treatise on Human Nature*.

———, *An Enquiry Concerning Human Understanding*.

Lewis, *Counterfactuals*.

———, *On the Plurality of Worlds.*

Menzies, "Counterfactual Theories of Causation."

Pruss, "The Cardinality Objection to David Lewis's Modal Realism."

Rubenstein and MacLeod, "Universals."

Tooley, *Time, Tense, and Causation.*

Weatherson, "David Lewis."

Questions to Consider

1. Do you find the idea that abstract objects exist problematic? Do you think it is reasonable to suppose that they exist because their existence would solve certain philosophical problems?

2. Do you find the idea that possible worlds exist problematic? Do you think it is reasonable to suppose that they exist because their existence would solve certain philosophical problems?

3. Is the ontology of someone who believes that possible worlds really exist (like David Lewis) more “bloated” than someone who believes that possible worlds are merely arrangements of propositions but thinks that propositions are abstract objects?

God—Definition and Paradox

Lecture 14

Metaphysics is the study of reality, including things that might exist outside our universe. You have learned about the possible existence of universals, propositions, and even other possible worlds—things that you probably have never thought about before. However, this lecture will turn your attention to something that nearly everyone has thought about before—something that, if real, at least according to many, also exists outside of our universe: God. The idea of a perfect being certainly is not completely debunked in this lecture, but it does face significant challenges.

Defining God

- In metaphysics, sometimes the debate is about how something should be defined. When it comes to God, there is a fairly standard definition, but it might not actually help. First, the standard philosophical definition of God, what is usually called the traditional definition, is not all that traditional; it has not always been the accepted definition. In addition, the standard definition may not line up with how the modern person thinks of God. Finally, the standard definition is subject to a number of objections that makes it quite problematic.

- Traditionally, God is conceived of as an absolutely perfect being—he or she has every good quality and to the maximum degree possible. God is supposedly unchangeable, transcendent, nonphysical, personal, omnipresent, and the creator of the universe. But for any one of these properties, there is an argument that suggests that it is inconsistent; for example, being omnipresent would imply that one is wholly and completely in all locations at all times. This might break down logically upon examination.

- Other arguments suggest that possessing two or more of these properties is logically impossible; the properties contradict one another. For example, is it possible to be a person and nonphysical? Being a person would include being minded, yet to be minded would seem to require having a physical brain. There are attempts to answer these objections, but such arguments have led some theists to not include some of these properties in their conception of God.

- Let's focus on difficulties that arise with three main properties that God traditionally is thought to have: all-encompassing power, knowledge, and love—what philosophers call omnipotence, omniscience, and omnibenevolence. For short, let's call such a being tri-omni.

- We need to be very clear about what each tri-omni property amounts to. Take omnipotence, for example. Philosophers usually insist that God's omnipotence does not include the ability to do that which is logically impossible, but they don't think that this subtracts from his or her power anymore than not being able to make nonsense statements true subtracts from his or her power.

- There are also similar limits to God's knowledge—certain things that it doesn't make sense to suggest that God knows. Being perfectly knowledgeable amounts to this: believing every proposition that is true and none that are false. Even though God is omniscient, he or she doesn't know anything about the exact properties of something that doesn't exist because there is nothing to know.

- God's omnibenevolence—the assumption that God is all good—entails that God is morally perfect; he or she always does what is morally best and never does what is evil or less than the best. Some have argued that the mere existence of evil in the world is evidence that an all-good being doesn't exist that would prevent such things. However, it could be that allowing evil sometimes is logically the only way to accomplish some greater good—some good that outweighs how bad the evil is.

- Today, some philosophers and theologians want to abandon the idea of a perfect tri-omni God because there are certain philosophical and logical problems that render the idea problematic. This is not to say that all philosophers agree; many think the idea is coherent. But there are a number of potential inconsistencies that have caused some to abandon it.

Omnipotence versus Itself

- In what way is the very concept of God supposedly logically problematic? The most famous divine paradox is probably the easiest to solve. It pits omnipotence against itself. Can God create a rock so heavy that he or she cannot lift it? If not, then he or she is not all-powerful. If so, then he or she is still not all-powerful. It seems that no matter how you answer the question, God is not all-powerful.

- Many try to avoid this divine paradox by appealing to logical impossibility: Creating a rock that God cannot lift seems to imply a logical contradiction, because God by definition is all-powerful. It's like saying that God can make the following proposition true: There is both an unliftable thing and a being who can lift everything. That seems to be logically incoherent—it's nonsense—so God's inability to make it true doesn't mean that he is not all-powerful.

- Most philosophers agree, but some suggest that this logical incompatibility actually reveals the problem. They think that the existence of an omnipotent being would entail that that nonsense statement is true, when it can't be. Thus, God can't exist.

Omnibenevolence versus Omnipotence

- The second difficulty lies with God's omnibenevolence, or moral perfection. First, moral perfection may be logically incoherent. For God to be morally perfect, it must be true that it is impossible for him or her to perform evil actions. However, one is morally praiseworthy for not doing an evil action only if it were possible for one to do that action in the first place. If God doesn't even have the option of doing what is wrong, how can he or she be morally praiseworthy for doing what is right? And if he or she isn't morally praiseworthy for what he or she does, how can he or she be a morally perfect being?

- A related problem suggests that God's moral perfection is logically inconsistent with his or her omnipotence, or infinite power. If God is all-powerful, then he or she must be able to do anything that is logically consistent. Certainly, he or she can do anything that a human can do. But humans can do evil actions. However, for God to be all-good, it seems that he or she cannot do evil. So, it seems logically inconsistent to suggest that God is both all-good and all-powerful.

- Some try to avoid these objections by insisting that God could do evil if he or she wanted to, but just doesn't want to and thus doesn't. This preserves God's ability to do evil—and, thus, his or her omnipotence—and also entails that God gets moral credit for not doing evil actions.

- This reply, however, might misunderstand the nature of moral perfection. Think of it this way. God doesn't just happen to know everything. If God is by definition perfect, then by definition, he or she must know everything. Anything that failed to know even one thing that was true would, by definition, not be God. Thus, it is necessarily true that God knows everything; it can't be true that he or she doesn't.

- In the same way, it seems that God doesn't just happen to always do what is morally best. God, by definition, is perfect and, thus, by definition, must always do what is best. Anything that did an evil action would, by definition, not be God; thus, it can't ever be true that God did an evil action.

Omnibenevolence versus Omniscience

- Another paradox pits God's moral perfection against his or her perfect knowledge. Moral responsibility requires free will. Thus, if God is morally praiseworthy for the actions he or she takes, then he or she must take them freely. However, God being all-knowing implies that God has foreknowledge.

- However, for the same reason that divine foreknowledge seems to be incompatible with human free will, divine foreknowledge would also be incompatible with divine free will. God's foreknowledge would entail that his or her actions are already written on the time line—even if God and his or her foreknowledge exist outside of the time line and, therefore, are timeless—and, thus, that it is impossible for him or her to do otherwise.

- But the problem is even worse for God. Because we don't know what God's beliefs about our future actions are, we can at least hold onto the illusion that we're free. We can deliberate about which action we should take because, from our perspective, there are multiple possibilities—even though there is only one. But God is aware of all his or her beliefs, so he or she already knows what he or she is going to choose. Deliberation is impossible for God, and it certainly seems that deliberation is required if an action is to be free.

- There are a number of ways that theists attempt to avoid this objection. Some theists might suggest that God is timeless and, therefore, the concepts of before and after don't really apply to him or her. But making sense of how a timeless being could have free will—how it could go through a process of deliberation and arrive at a choice—is equally problematic. To avoid this problem, one might adopt a definition of free will that does not require alternate possibilities.

Newcomb's Paradox

- Newcomb's paradox points out that omniscience seems to give rise to the possibility of logically impossible situations. Suppose that God gives you a choice. In front of you are two boxes. One is clear, and you can see $1,000 inside it. The other is black, and you cannot see inside it. God then tells you that you can choose to have what's under the black box or what's under both boxes.

- What's under the black box? God tells you that it's one of two things: nothing or $1 million. But here's the catch: God's decision about what to place under the black box has already been made, and the money has already been placed. If the $1 million is there, it's already there; if not, it's not.

- But, God says, "I put $1 million under the black box only if I thought that you wouldn't be greedy and choose both boxes. If I predicted that you would choose only the black box, then I put $1 million under that box. If I predicted that you would choose both boxes, then I put nothing under the black box."

- What should you choose? Which choice would maximize the amount of money you receive? On one hand, you should choose only the black box. Because God is infallible, he or she would have known your choice and would have put $1 million under that box. On the other hand, you should choose both boxes. After all, the action of placing the money is already done, and God either placed the $1 million under the black box or didn't.

- If he or she did, then choosing the black box would get you $1 million, but choosing both gets you $1 million and $1,000. If he or she did not place the $1 million under the black box, then choosing only it would get you nothing—whereas choosing both would get you at least $1,000. So, regardless of what he thought you would decide, because the deed is already done, you should choose both. Choosing both boxes is both the rational thing to do and the irrational thing to do.

- The existence of an omnipotent being gives rise to the possibility of a logical contradiction being true—and that's impossible. So, it seems that the existence of an omniscient being is impossible.

- The best way to avoid this paradox is to argue that one choice is the most rational one. Philosophers have done just this, but the debates just go around in a circle. Philosophers are basically split on the issue. If you think that one option is clearly the more rational choice, then this paradox produces no difficulty. But if not, this constitutes a serious objection.

Suggested Reading

Armstrong, *A History of God.*

Drange, "Incompatible-Properties Arguments."

Frankfurt, "The Logic of Omnipotence."

Hasker, "Can God Be Free?"

———, *God, Time, and Knowledge.*

Johnson, "The Failure of Plantinga's Solution to the Logical Problem of Natural Evil."

Kushner, *When Bad Things Happen to Good People.*

Martin and Monnier, eds., *The Impossibility of God.*

Mavrodes, "Some Puzzles Concerning Omnipotence."

Morris, *Our Idea of God*.

Pickover, *The Paradox of God and the Science of Omniscience.*

Plato, *Timaeus.*

Nozick, "Newcomb's Problem and Two Principles of Choice."

Rowe, *Can God Be Free?*

———, "The Problem of Divine Perfection and Freedom."

Shults, *Reforming the Doctrine of God.*

Swinburne, *Coherence of Theism.*

Questions to Consider

1. How do you conceive of God? Is he or she perfect? What does that entail? If God is not perfect, then what properties does he or she lack?

2. Can you think of any more potential problems for the classic, traditional, perfect conception of God? Google "divine paradoxes" to find more.

God—The Argument from Existence

Lecture 15

The God that will be discussed in this lecture is the traditional God—the perfect being. The argument is called the ontological argument, or the argument from existence. The advantage of the ontological argument is that it is purely conceptual. You don't have to observe anything in the world to know whether or not its premises are true. In addition, it's a deductive argument. The conclusion of a sound deductive argument is guaranteed. So, if the ontological argument works, then God's existence is proven. Constructing a sound deductive argument, however—especially one with such a grandiose conclusion—is a difficult task. And the ontological argument likely falls short.

Anselm's Ontological Argument

- The ontological argument was first put forth by Anselm, a medieval Benedictine monk who served as archbishop of Canterbury from 1093 to 1109. In a nutshell, he suggests that God must exist because to believe that God doesn't exist—to conceive of God as not existing—entails a logical contradiction.

- First, Anselm suggests that it's obvious that, for any given object, an object that exists in the real world is greater than or more perfect than an idea of that object—an object that only exists in one's understanding. This is especially true if all that sets the two objects apart is that one exists in reality and the other one exists only in your mind.

- Next, Anselm points out that God is a perfect being—at least that's the definition he's working with. And that means, as Anselm puts it, that God is the greatest conceivable being. If God is perfect, then it is not possible to conceive of a being greater than God; it's not possible to be greater than perfection.

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Anselm's argument for the existence of God is known as the ontological argument.

- Next, Anselm observes that he has an idea of God. He looks in his mind and sees an idea of God floating around in there. And because, by definition, God is the greatest conceivable being, that idea of God floating around in his head must be an idea of the greatest conceivable being.

- But, Anselm says, let's suppose that you don't believe that God exists. If that is the case, then your idea of God does not include the property of existence. According to Anselm, what it is to believe that something exists is to have an idea of it in your mind and ascribe the property of existence to it. If you don't believe in God, then you have the idea, but your idea does not include the property of existence.

- But the thing is that if your idea of God does not include the property of existence, then it's not really an idea of the greatest conceivable being. Why? Because someone could conceive of a being greater than the one you are conceiving of. How? By conceiving of a being just like the one you are conceiving, but also slapping the property of existence on it—that is, by believing that it actually exists.

- According to the first premise, because any being that exists in the real world is better than one that just exists in the imagination, if someone takes your idea of a nonexistent God but then believes that it exists, that person's idea is greater.

- But if your idea of God is not an idea of the greatest conceivable being, then it's not really an idea of God. So, if you say that you don't believe that God exists, then you are saying that you have an idea of God, but that the idea is not actually of God—and that's a contradiction. And logical contradictions can't be true.

- So, Anselm reasons, if not believing in God would entail something that can't be true, then God must exist. It's basically a reductio ad absurdum argument, which proves that something is wrong by assuming it is right and then showing that an absurd consequence follows doing so. Anselm is pointing to the absurd consequence of a logical contradiction being true as something that follows from believing that God doesn't exist.

- Anselm prefaces his argument with Psalm 14:1 "The fool hath said in his heart, 'There is no God.'" Anselm is essentially arguing that people who say that they don't believe in God are contradicting themselves. They are basically saying that their idea of God both has the property of existence (because it is an idea of the greatest conceivable being) and does not have the property of existence (because they do not believe that God exists). Only a fool would contradict themselves, and if you must believe in God or be a fool, then God must exist.

Objections to Anselm's Argument and Anselm's Second Argument

- There are a number of objections that have been raised to Anselm's argument over the years, but the most famous objection to this version of Anselm's argument belongs to another 11th-century clergyman-philosopher named Gaunilo of Marmoutier, who argued against the validity of Anselm's argument by presenting a counterexample—an argument that takes the exact same form as Anselm's argument and has premises that are just as obviously true, but whose conclusion is obviously false. This demonstrates that Anselm's argument is invalid—that his conclusion does not follow from its premises.

- To do this, he takes Anselm's argument, exactly as it is, and simply replaces the word "being" with the word "island." If Anselm's argument works, then Gaunilo's argument would prove that a greatest conceivable island must exist. However, not only does such an island not exist, but clearly the fact that an imaginary perfect island is not as good as a real one doesn't establish that one exists. In a sense, Gaunilo presents a reductio of his own: If Anselm's argument is valid, then a perfect island exists; clearly, it doesn't, so his argument must be faulty.

- Anselm responds by saying that the reasoning of his argument can only be applied to God, not to things like islands. Unfortunately, his argument to this effect is not exactly clear. But, in essence, it goes like this: Because the greatest conceivable being is both uncreateable and indestructible—and, in fact, if it were to not exist at any moment in time at all, it would not be the greatest conceivable being—then existence must be part of its essence, part of its definition. This is not true of the greatest conceivable island because it is at least creatable, so existence is not part of its definition. But because existence is part of the definition of the greatest conceivable being, it must exist.

Kant's Objection: Existence Is Not a Property

- The most famous and damning objection to Anselm's argument, which hits the second version of his argument directly, is Kant's objection to it. Anselm argues that God must exist by definition, because existence must be part of God's definition, because existence is a property that God must possess necessarily if he or she is the greatest conceivable being.

- Kant points out that this argument is unsound because its primary assumption is false: Existence is not a property. It is something that an object must do before it can even have properties. In fact, not even that quite captures it because objects can't do anything unless they exist. Properties are things like redness, mass, charge, and being all-knowing—existence is not one of them. Thus, it cannot be part of the definition of the greatest conceivable being, and thus, it is not the case that the greatest conceivable being exists by definition.

- Some philosophers disagree and try to save the idea that existence is a property, but these philosophers are in the minority. However, others have argued that Kant's objection does not apply to the second version of Anselm's argument. This is a difficult claim to evaluate, given that Anselm's second argument is not that clear to begin with. But the claim they make is that Anselm's second argument does not presume that existence is a property; it only assumes that necessary existence is a property. Of course, it's difficult to explain what the property of necessary existence is, but according to them, it is a property that a being possesses when it must exist—when it can't not exist.

- It's not clear that necessary existence actually is a property, or at least it's not clear that assuming so doesn't presume that existence itself is also a property. It seems that to suggest that something necessarily exists is to suggest that it has the property of existence by definition. So, it's not clear that this solves any problems.

- But even if we ignore that difficulty, the argument only works if necessary existence makes an object better—and, thus, a perfect being must have it. But this is not clearly the case. If an object already exists in our world, the fact that it exists in all possible worlds would not make it any better.

Modern Ontological Arguments

- Some philosophers, most notably Alvin Plantinga and Norman Malcolm, have tried to use possible-world semantics to present an argument similar to Anselm's that they believe establishes God's existence. Let's call it the modal argument.

- A possible world expresses a different way that all reality could have been. Something is possible if it is true in one possible world, something is impossible if it is true in no possible worlds, and something is necessary if it is true in all possible worlds.

- With that in mind, the modal argument is simple. It's possible that a necessary being exists—the concept of a necessary being is conceivable and is not logically inconsistent. But that means that a necessary being exists in at least one possible world. But, by definition, a necessary being is one that exists in all possible worlds. So, it follows that in one possible world, there is a being that exists in all possible worlds. The actual world is a possible world. Therefore, that necessary being must exist in the actual world. And, of course, that being would be God.

- In simpler modal terms, the argument goes like this: If God is possible, then he or she is necessary. God is possible. So, he or she is necessary—and if God is necessary, then he or she exists. The argument is clever. But most philosophers agree, even theists, that there is something fundamentally wrong with it.

- The argument begs the question—it assumes what it is trying to prove. To accept its premise that God's existence is possible, we would have to already admit that God exists. Even if we aren't realists about possible worlds, the argument still begs the question and, thus, fails. In a way, the argument is backward; it puts the cart before the horse. But no other argument besides the ontological argument argues directly for the existence of a perfect being.

Suggested Reading

Anselm, *Proslogion.*

Himma, "Anselm's Second Version of the Ontological Argument."

Kant, *Critique of Pure Reason*.

Plantinga, *The Nature of Necessity*.

Vilenkin, “Creation of Universes from Nothing.”

Questions to Consider

1. Even before you figure out exactly what’s wrong with it, it seems obvious that Anselm’s original ontological argument doesn’t work. Why do you think he proposed it? Do you think that he knew it didn’t work, but proposed it anyway?

2. Here is an ontological argument against God’s existence: If God exists, then he or she exists in all possible worlds. It’s possible that God doesn’t exist. If it’s possible that God doesn’t exist, then he or she doesn’t exist in at least one possible world. If God doesn’t exist in one possible world, then he or she doesn’t exist in them all. Therefore, God doesn’t exist. This argument is valid; essentially, it’s Plantinga’s argument in reverse. Do you think it works? Why, or why not? What does your answer say about the soundness of Plantinga’s argument?

God—The Argument from Cause

Lecture 16

In this lecture, you are going to learn about the cosmological argument—the argument from cause. You will learn that although it does not point specifically to a perfect being, if successful, it will point to some kind of divine being. However, in exploring this argument, you are also going to get at a more fundamental metaphysical question about the universe: Why is there something rather than nothing? Think of this exploration of the cosmological argument not only as a foray into whether God exists, but also into why the universe exists.

The Argument from First Cause

- There are multiple versions of the cosmological argument. The simplest one goes like this: Every event has a cause. But every cause is itself an event, which means that it must have a cause. But that must also have a cause, so there seems to be a causal chain—a progression of causes and effects reaching back into the past.

- But that causal chain can't be infinite; it cannot just keep going back forever. It must end in something, and whatever it ends in must itself be a cause but must not be caused by anything else: It must be an uncaused causer that sits at the end of the causal chain. And that uncaused cause must be God.

- There are multiple problems with this argument. First, it seems to jump to the God conclusion far too quickly. Even if there is a first cause, nothing in this argument tells us anything about the nature of that cause—that it is all-knowing, all-powerful, all-good, or even that it is a being or person. You would need a separate argument for that, and although a few have been proposed, philosophers aren't very convinced by them.

- But perhaps the argument establishes that there is a first uncaused cause. Might that at least need to be some kind of deity?

Unfortunately not. First, we know that the universe originated from a singularity—an infinitely small point that existed for no time and is governed by no known laws—from which the big bang was generated.

- So, we already have a candidate for a first cause: the singularity from which the universe emerged. And, if anything is a candidate for something that is uncaused, it would seem to be the singularity. First, because the big bang marks the beginning of time, nothing can come before the singularity. However, causes precede their effects. So, it seems that the singularity cannot have a cause because nothing can come before it.

- In addition, the singularity is about as simple as you can get. It is as small as you can get, exists for no time, and is governed by no laws. Whatever else you introduced as a cause for the singularity would seem to demand a cause even more than the singularity itself, especially if you introduced a deity that has a wide array of infinite properties, like omnipotence. So, at least initially, if there must be an uncaused causer, it seems that the singularity is the most likely candidate. The only thing that would seem to demand a cause less than the singularity would be nothingness.

- But, ironically, nothingness may actually be the explanation for the singularity. First, because of quantum mechanics, we know that there are uncaused events. So, we actually know that the first premise of this argument—that every event has a cause—is false. But more importantly, it is common knowledge in quantum mechanics that the creation of matter can be uncaused—that it can spring from nothing. So, even if there is an uncaused causer, it need not necessarily be a deity of any kind. The singularity would be a much better candidate for an uncaused causer, because it is nearly propertyless.

- But there may not even need to be an uncaused causer because there may not even need to be a first event. Perhaps the causal chain actually is infinite. Some have suggested that this is impossible because nothing in the universe is actually infinite, not even the universe itself. Only nonexistent hypothetical entities, like number lines, can be infinite.

- But this suggestion is problematic. First, theists can't embrace this line of reasoning because they believe that God is infinite—and, certainly, they believe that God is real. Second, the assumption is wrong—black holes exist, and they have infinite volume. Besides, it's not certain that we really understand infinity well enough to be declaring whether it's impossible.

- The final problem with the first cosmological argument is that it seems to refute itself. It stipulates that every event has a cause, but every cause is an event. It follows from this necessarily that anything that is a cause must be caused. But then it concludes that there is a cause that is not caused—an uncaused causer. You can't say that every cause has a cause, but then say that there is a cause that doesn't have a cause. The conclusion of the argument is refuted by its first two premises.

The Principle of Sufficient Reason

- Recognizing the shortcomings of this argument, some have revamped and revised it into an argument regarding explanation. The primary premise of this argument is called the principle of sufficient reason. It suggests that everything needs an explanation. So, everything either has an explanation outside of itself or is its own explanation.

- Philosophers call something that is explained by something else a dependent entity; it is dependent on something else for its existence. But, the argument assumes, it can't be that everything is dependent; it can't be that everything is explained by something else. This would seem to generate an infinite chain where each thing is dependent on the next.

- Proponents of the argument suggest that this is impossible because the existence of that chain would violate the principle of sufficient reason—the chain itself would need an explanation. So, the argument concludes, something must be nondependent, something must be its own explanation. And that would be God.

- There are numerous objections to this argument. First, the principle of sufficient reason is problematic. It seems to ignore the possibility of brute facts—things that are true for no reason. The principle amounts to saying that the truth-value of every proposition must have an explanation for why it has the truth-value it has. But it's not clear that this is the case.

- Second, contrary to what the argument assumes, an infinite chain of dependent beings—each dependent on the next—may not violate the principle of sufficient reason. It states that everything needs an explanation, but if all that exists is an infinite chain of dependent beings each explained by the last thing in the chain, then everything does have an explanation—the thing before it. The argument demands that the chain itself needs an explanation, but it's unclear why you must view the chain itself as an extra thing that needs an explanation.

- Lastly, like the argument before it, this argument seems to jump to the God conclusion. Even if there is a self-explained thing, nothing in this argument entails that that thing must be all-powerful, all-knowing, etc. That would require a separate argument, and none are regarded as persuasive.

The Kalam Cosmological Argument

- Some theists maintain that the universe can't be its own explanation, but God can. So, it is preferable to introduce God as a self-explained entity to thus explain the universe, which demands an explanation. Why does the universe demand an outside explanation but God does not? Because, the argument suggests, everything that begins to exist must have an outside explanation.

- Think about all the objects you have come across in your lifetime—all of them began to exist, and all of them have an explanation. The universe is like this, too; it began to exist. But God, if he or she exists, did not—he or she always has been. So, he or she doesn't need an outside explanation. This argument is called the Kalam cosmological argument.

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The Kalam cosmological argument proposes that the universe demands an outside explanation, but God does not.

- There are numerous objections to this argument, some of which are simple and some of which are complex. The most complex objection observes that the argument seems to beg the question—to assume the truth of what it tries to prove.

- The Kalam cosmological argument built up your intuition that everything needs an explanation by using examples of things from your everyday life that began to exist and need an explanation. But the object that is being explained is just an arrangement of the matter of the universe. What is being explained is how that matter got to be in the arrangement it did. It is when that matter was arranged as such that the object came into existence.

- The matter that makes up everyday objects is the matter of the universe, so to demand that the matter that makes them up needs an explanation is the same thing as demanding that the universe needs an explanation. So, in short, the Kalam cosmological argument begins with the premise and ends with the same conclusion: The matter of the universe needs an explanation. Clearly, this argument gets us nowhere.

- Why is there something rather than nothing? Why is the proposition "there is something" true? If we think that everything needs explanation, then we might simply say that this fact explains itself. But, ultimately, it's likely better to just appeal to brute facts—

propositions that are true have no explanation. They are just true. Perhaps "there is something" is a brute fact.

- Even if we don't have an explanation for the universe, invoking an unexplained, incomprehensible being—any kind of deity—as the explanation actually explains nothing.

Suggested Reading

Aquinas, "Five Ways."

"Cantor's Diagonal Argument," *Wikipedia.*

Draper, "A Critique of the Kalam Cosmological Argument."

O'Connor, *Theism and Ultimate Explanation*.

Parfit, "The Puzzle of Reality."

———, "Why Anything? Why This?"

———, "Why Does the Universe Exist?"

Pruss, *The Principle of Sufficient Reason*.

Schick, Jr., "The 'Big Bang' Argument for the Existence of God."

Smith, "Simplicity and Why the Universe Exists."

———, "The Uncaused Beginning of the Universe."

———, "World Ensemble Explanations."

Tryon, "Is the Universe a Vacuum Fluctuation?"

Vuletic, "Creation Ex Nihilo—Without God."

Questions to Consider

1. Consider the following question: Why is there something rather than nothing? How intellectually satisfying do you find it to suppose that the existence of the universe, the singularity from which it sprang, or the existence of quantum foam is a brute fact—that it has no explanation? Is there something else you could hypothesize as an explanation for such things that would be more intellectually satisfying—that would not require an explanation itself, that would entail a simpler hypothesis, that wouldn't simply raise more questions? If so, what would that be, and why?

2. Suppose that you have a set of three things: A, B, and C. Suppose that A causes B to exist, B causes C to exist, and C causes A to exist. Is this set of objects self-explanatory? Does it explain its own existence, or does the set itself require an explanation outside of it? If it is not self-explanatory, then what would it mean for an object to be self-explanatory?

God—The Argument from Design

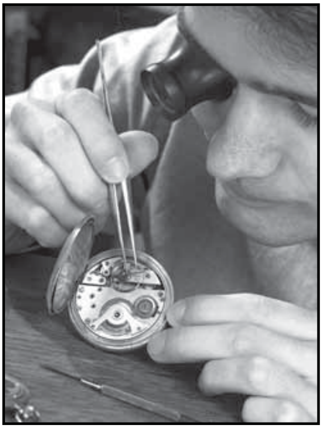
Lecture 17

The Earth seems to be specifically designed to support life. Might it require a designer? Perhaps most impressively, the universe itself—the laws that govern it—seem to be fine-tuned to make the evolution of life possible. Does that point to a designer? The teleological argument—known as the argument from goals, or the argument from design—is probably the most academically cited argument for God's existence. But the argument is also directly related to questions about the nature of the universe and why it is the way it is. So, as with the cosmological argument, you should keep in mind such questions as you consider the teleological argument.

Paley's Watch Argument

- Although Thomas Aquinas—probably the most recognized of the Catholic medieval philosophers—put forth an earlier version of the design argument as his fifth way to prove God's existence, the most famous design argument belongs to the 18th-century philosopher William Paley.

- Paley pointed out that if you found a stone, you would not likely conclude that the stone had a designer; however, if you found a watch, you would certainly conclude that it had an intelligent designer because it clearly has parts that were placed with a purpose. Paley argues that, in the same way, biological beings like humans have parts placed for a purpose. Thus, we must have a designer.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Humans seem like they have an intelligent designer because they have parts that were placed with a purpose—just like a watch has.

- Although it was probably thought to be a good argument given what people knew at the time, Paley's argument can no longer be considered a good argument. Put simply, the theory of evolution—one of the most well-established theories in all of science—shows that Paley was wrong.

- Evolution shows how living organisms can have parts that have particular functions without those organisms being designed. Evolution is not incompatible with theistic or Christian beliefs. In fact, most religions and religious organizations in the world are openly accepting of the theory of evolution.

- Paley's failure also teaches us that it's dangerous to justify your belief in something by using that thing as an explanation for a currently unexplained thing—because science is so good at explaining things. A large portion of what was previously unexplained, or even seemed inexplicable, is now explained by science.

The Fine-Tuning of the Earth

- The fact that evolution so soundly defeated Paley's argument gave rise to another kind of design argument: the argument from fine-tuning. The first such argument points out that it seems that the Earth is fine-tuned for evolution to occur. So, we need not hypothesize the existence of a designer to explain our biological parts—evolution can do that—but we need an explanation for why evolution could occur on the Earth to begin with. It seems that conditions on Earth are just right for evolution to occur—so fine-tuned that it seems that someone intended for life to evolve.

- But like the cosmological argument, as an argument that points specifically to the traditional, perfect, tri-omni God of theism, this argument falls short; a being who fine-tuned the Earth for evolution would need to be powerful, but not necessarily perfect or all-powerful. Nevertheless, the argument suggests, some kind of deity must be responsible for Earth meeting the various conditions necessary for evolution to occur.

- The main problem with this argument is that it mistakes the odds—it suggests that such fine-tuning is improbable, when it actually isn't. What are the chances that some planet somewhere in the universe will have all the right conditions? Given the size of the universe, it's a near guarantee. So, although the odds that this particular planet would have the right conditions for life is low, that life evolved on this planet does not need an explanation.

The Fine-Tuning Argument

- The fact that there are many planets, each with a chance of having the right conditions for life to evolve, means that we need not invoke a designer to explain why our planet has the right conditions for life. But isn't there just one universe? And aren't the laws of the universe set up in such a way to guarantee that life evolves? If so, might we need to invoke a designer to explain why our universe is fine-tuned for life? Indeed, we might, and that is the basis of the fine-tuning argument that philosophers and scientists are most concerned with today.

- The argument goes like this: Almost everything about the basic structure of the universe (its laws and its initial state) seems balanced on a razor's edge for life to evolve—that is, the universe seems fine-tuned for life. Why? Because if any one of its forces or constants were slightly different than it is, then life could not evolve.

- And it seems that this kind of fine-tuning is much more probable on theism than atheism. It's possible that the universe could just so happen to have fine-tuned without the work of an intelligent force, but it seems unlikely—whereas the universe being fine-tuned is exactly what you would expect if it were created and designed by some kind of benevolent deity. It's as if all the dials that determine what the laws and constants that govern the universe are seem to have been set by someone in the one and only position that he or she would have to be in for life to evolve.

- Those who defend the fine-tuning argument cite supposed fine-tuned factors, including the notion that if gravity had a slightly different strength than it does, stars would either be too weak or too cool to support the evolution of life. This argument sounds impressive, and some even think that it is conclusive; however, there are actually a number of very serious problems with the argument.

- First, even if the universe is fine-tuned, it's not clear that the purpose of this fine-tuning is the evolution of life. Given the relative scarcity of life that exists in the universe, it seems that what the universe is actually fine-tuned for is galaxy formation and that life is just an unintended consequence. So, even if the universe is fine-tuned, it does not point to the existence of a traditional theistic god, or even a nontraditional one.

- Second, the argument seems to invalidate itself. If the complexity of the universe demands a fine-tuner, then the creator of that universe would demand a fine-tuner as well. But then the designer of that designer would require a fine-tuner, etc. So, either you have an infinite regress of fine-tuners, each fine-tuning the next, or somewhere along the line you're going to have to end that regress with something that itself needs fine-tuning but doesn't have it. Something's complex design is just going to have to be a brute fact.

- Third, the fine-tuning argument suggests that the universe must be fine-tuned because if any of its laws or constants had a different value, then the universe could not support life. But that assumes that the values could be different—yet there is no argument presented for why they could be different than they are.

- Additionally, the motivation for this version of the fine-tuning argument started with the assumption that there is only one universe, and if the universe only had one chance to get it right, then the chances that it got it right are very low. But this follows only if there is only one universe.

- However, we are now discovering that there are reasons to think that there are multiple universes. If there are multiple universes and in each one the laws that that universe is governed by are set randomly, then the chances that we would eventually get a universe that is conducive to evolution is not unlikely at all.

The Universe Is Not Fine-Tuned

- Perhaps the most fascinating objection to the fine-tuning argument is this: Fine-tuning is not actually improbable. There are number of reasons for thinking this. First, to make it seem improbable that the values in question have the values they do, the fine-tuning argument assigns an equal probability to all possible values that they could have. However, with most things, this is not how it works. All values are not equally probable.

- Most probabilities have a bias, regardless of whether that bias is explained by a person or natural conditions. So, unless there is evidence that no such bias exists for the factors that govern the laws and constants of the universe, we can't assign equal probability to all values—which the argument does.

- Second, the fine-tuning argument exploits misleading units of measurement to make the fine-tuning seem much more amazing than it is. Another objection is found in the fact that the values of the probabilities in the conclusion of the fine-tuning argument are either meaningless or worthless. You can only make sense of probabilities if you are working with finite amounts; "one in infinity" is a meaningless probability. Whether or not fine-tuning is improbable depends solely on one's arbitrary choice, and if so, anyone could choose anything they like and make the fine-tuning of the universe as likely or unlikely as they want, but any such pronouncement would be completely worthless.

- The last objection actually exposes a fallacy committed by the fine-tuning argument. Recall that the reasoning of the fine-tuning argument is this: If any one of the many laws, constants, or values that govern how the universe were different, then life could not evolve. From this, they concluded that there is only one set of values that those laws, constants, and values could have for the universe to be compatible for life. So, they reason that the likelihood that it would have that particular one set of values is low.

- Changing only one constant might make the universe uninhabitable, but changing more than one constant could compensate for the changes in the others and make it still habitable. There is more than one way to set the dials and get a universe conducive to life. What's more is that many of these supposedly fine-tuned values are intrinsically linked; changing one necessarily and automatically changes the other and keeps them in balance such that galaxies, stars, and life are possible.

Suggested Reading

Armstrong, *The Bible*.

Collins, "A Scientific Argument for the Existence of God."

Coyne, *Why Evolution Is True*.

Craig and Moreland, "The Existence of God."

Deem, "Evidence for the Fine Tuning of the Universe."

"Drake Equation," *SETI Institute.*

Flew, *There Is a God*.

Johnson, "Taking a Leap of Faith."

Manson, "The Fine-Tuning Argument."

Paley, *Natural Theology*.

Ross, "Fine-Tuning for Life on Earth."

Stenger, "The Design Delusion."

Weatherson, "David Lewis."

Questions to Consider

1. Suppose that the laws that govern the universe are fine-tuned. Consider the fact that the laws that govern our universe necessitate the occurrence of hurricanes, tornadoes, earthquakes, floods, diseases, and plagues. How does this affect your opinion of what a fine-tuner of our universe would be like?

2. If there is a perfect being, then all of its properties are perfectly balanced. If any one of its properties were different to any degree, it would no longer be perfect; there is no way you could compensate for a change in one property by changing another property to retain perfection. Any change in a perfect being at all would make it imperfect. Does this mean that if there is a perfect being, it must be fine-tuned?

3. Are there dangers for theistic belief in pointing to something that seems to be unexplained, such as fine-tuning, as an argument for God's existence?

4. Given the last few lectures, how important would you say that understanding science is to the study of metaphysics? How would you describe the relationship between science and metaphysics?

From Spinning Buckets to Special Relativity

Lecture 18

Einstein's theory of relativity is one of the most important, influential, and intimidating theories in all of science. At first, it was not well accepted because it entailed some very counterintuitive things: that light is affected by gravity, that gravity isn't really real—its effect is just a result of the curvature of space-time. It suggests that some properties that seem to be objective are actually relative to a reference frame. This is why, even after Einstein's theory was confirmed, so many scientists still refused to accept it, even though it is universally accepted today.

Space and Time: The Substantival and Relational Views

- One of the driving forces behind Einstein's development of relativity was questions about the nature of space itself. Think about the space between the Earth and the Sun. A few planets, a few asteroids, and comets aside, that space is empty—there is nothing in it. But what does "space" mean in that sentence? Is space itself a kind of substance in which objects sit? Or is space more of an idea that we use to keep track of the relationships between objects?

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Is the space between the Earth and the Sun a substance or an idea?

- What would be the difference between the substance view and the relational view of space? Consider a universe that consists of only two objects: two persons, facing each other, just floating in space. Is it possible for those persons to both move exactly one foot to the left at the same time? If this happens, there will be no noticeable difference for either person. Each would be facing the same direction and be the same distance from the other person both before and after the supposed move. The spatial relationship between the two persons would not change.

- On the substance view, this is possible. On the substance view, the space in which the persons are floating is a real thing—a substance, with its own properties and facts—and they could move within it. These are matters of fact that can serve as truthmakers for propositions like “both persons moved one foot to the left.”

- However, on the relational view, this is not possible. If space is not a real thing and all that exists is the relationship between objects, then in relation to what would both persons move to the left? Because both of them are “moving” the same direction and distance, the relationship between the two persons does not change, so on the relational view, there is no change. Therefore, there can’t be a truthmaker for “both persons moved one foot to the left.” The only way a change could occur is if a relationship changed—like if the distance between them increased.

- That is the difference between the substance, or substantival, view and the relational view of space. There is a similar debate about the nature of time. Is time a substance or dimension in which objects travel, or is time merely a conceptualized way of keeping track of change? Does time really pass, or are changes just constantly happening? Again, there are a substantival and a relational view.

- To differentiate these views, ask yourself whether it is possible for all change and movement in the universe to stop at once, stay stopped for 100 years, and then start up again. If this were to occur, we would not be able to tell. Not only would we not age, and not only would our hair not grow, but because all movement and changes in our brains would cease, we would have no awareness and form no memories.

- A temporal ontology that includes a past, present, and future would seem to be more in line with the view that time is a substance. We could make perfect sense of what it would mean for no change to occur for a year. The time line would simply contain a year's worth of identical moments. However, if you thought that the past and future don't exist—that all that ever exists is the present moment—then it would seem to make more sense to suggest that if change stops, time stops.

Evidence for the Substantival View

- For a long time, there was thought to be good evidence and reasoning behind the substantival view of space. An example is Newton's spinning bucket. Imagine a bucket filled with water and secured upright in the middle of a merry-go-round. As the bucket spins, the water will slowly climb up the sides of the bucket so that the surface of the water in the bucket becomes concave.

- In the relational model, this change in the water's surface must be due somehow to a new relation that it has to something else in the world. It must be spinning in relation to something that causes its surface to become concave. But what could it be?

- It can't be the merry-go-round; that's spinning along with the bucket. Besides, take the merry-go-round away, and just spin the bucket, and you will get the same effect. It also can't be because the bucket is spinning in relation to the rest of the objects on the playground. If you were to take all of that, ground included, and put it on a giant merry-go-round with the bucket at the center, you'd see the same effect.

- Newton argued that the only answer that makes sense is the substantival model. The bucket is spinning in relation to space itself: Space is a substance, and the bucket is spinning within it. In the relational model, if there were a universe that only contained a bucket full of water, if the bucket started spinning, nothing would happen; the surface of the water wouldn't become concave, and there would be no way to even tell if it was spinning because there would be nothing else in the universe to which its relationship changed.

- But Newton thinks that it would change—that the water in a bucket spinning in an otherwise empty universe would become concave, and that's because the bucket would still be spinning with respect to space itself.

Special Relativity

- Proving the substantival view wrong was one of Einstein's main motivations for hypothesizing the theory of relativity. The word "relativity" in the title of Einstein's theory is somewhat ironic because it begins with the assumption that certain very important things are not relative—they are constant. Specifically, the laws of physics are constant. Einstein suggested that they are constant in all inertial reference frames.

- Basically, there is a reference frame for any way that you may be moving or standing still in space. And it's important to realize that, in relativity theory, the existence of a reference frame is not dependent on an observer; no one need actually be moving or standing still in that reference frame for it to exist. It's more of a conceptual apparatus—a way that physicists describe how an observer could be moving. It's not necessarily a way that an observer actually is moving.

- Special relativity only applies to inertial reference frames; that is, it only applies to reference frames that are not accelerating. Einstein suggests that the laws of physics are constant in all inertial reference frames. You cannot distinguish among inertial frames of reference by differentiating their physical laws from one another, because the laws remain constant from one frame of reference to the next. According to Einstein, this includes, most importantly, the speed of light.

- If true, this goes against the substantival view. If space were a real substance in which light traveled, then its speed would be determined in relation to that substance. Einstein said that if you measure the speed of light, no matter how fast you are going, or where the light is coming from, you always get the same value—which is, approximately, 300 million meters per second.

- If space is not a substance, then there is no reference frame that gives you a true objective determination of everything that is happening. That's not to say that there is no objective truth; for example, if an object exists, then it exists in all reference frames, or if an event happens, then it happens in all reference frames. But some properties that that object has or when the event takes place will be relative to reference frames—there will be no objective fact about such things.

- There would be a privileged reference frame if space were substantival; the reference frame of motionless space itself would represent the objective truth. But without that, there is no fact of the matter about which reference frame gets it right.

- The consistency of the speed of light in all reference frames has very interesting consequences. For example, not only are speed and motion relative to reference frames, but so is simultaneity—whether two events happened at once. Because the speed of light is constant, whether or not two events are simultaneous is relative to reference frame.

- Simultaneity is not the only thing that is relative. Length is also relative. If someone is traveling past you and holding a yardstick, while you hold a yardstick, they will measure your yardstick as being shorter than theirs, while you will measure theirs as shorter than yours. Another example is that a pencil on your right is also to the left of the person sitting across the table from you. It all depends on your frame of reference.

- We can also use the consistency of the speed of light to demonstrate what is called time dilation—that the amount of time between events, the speed at which change is occurring, and the passage of time itself are relative to reference frame.

- This is what Einstein's theory of relativity suggested was true, but is there any way to verify this? In fact, there is. Time dilation has been observed. The half-life of muons—extremely fast-moving particles—is measurably longer if they are moving past us, whereas if they are sitting in a laboratory, their half-life is notably shorter.

- The phenomenon of time dilation shows us that space and time are related, and we are again wondering about whether space and time are substantival or merely relational. Does the relativity of simultaneity, length contraction, and time dilation indicate that space and time are merely relationships between events—that all there is are different facts about how events are related in different reference frames? Or are space and time themselves, as substances, somehow being stretched or compressed in different reference frames? And given their direct relation, are space and time actually just one substance?

- Indeed, even though Einstein was highly motivated against the substantival view, as he formulated his theory, he often spoke of space-time as if it were something in which objects were situated and events occurred. Einstein even spoke as if space-time curved around massive objects. This gives the impression that despite his initial inclinations against it, Einstein became a substantivalist—not one about space, and not one about time, but one about space-time.

- One more element of Einstein's special theory of relativity is that nothing can travel faster than the speed of light. This rule holds for both objects and information and follows from one simple fact: Causes must precede their effects. The cause of an event cannot happen after the event it causes.

Suggested Reading

Kosso, *Appearance and Reality*.

"Minkowski Diagram," *Wikipedia.*

Shoemaker, “Time without Change.”

“Visualization: Minkowski Diagrams,” *Brown University.*

Questions to Consider

1. Relativity suggests that there is no preferred reference frame—that no reference frame has special properties that make it better than another. But since the big bang, the intensity of the microwave background radiation left from it has been slowly decreasing, and there are reference frames where the intensity of that radiation would not be uniform—it would be more dense on one side of the universe than another. In fact, all reference frames but one would be like this. Does that mean that there is something special about the reference frame in which the intensity of the microwave background radiation is uniform across the universe? Could that reference frame be used to determine objective facts about simultaneity, length, and duration? What consequences might follow from this?

2. Suppose that you could use the effects of relativity to slow down or speed up how fast time passes for you. Would you do it? Why, or why not?

From General Relativity to Space-Time

Lecture 19

Einstein's theory of special relativity was motivated by his desire to avoid a specific metaphysical position about the nature of reality: the substantival view, which suggests that space itself is a substance. But Einstein's theory of relativity—specifically, his theory of general relativity—seems to commit one to a substantival view of what Einstein called space-time. So, Einstein's theory might have committed him to the very kind of thing that he wanted to avoid. Must relativity be interpreted in this way?

General Relativity: The Basics

- In special relativity, all laws of physics—including the speed of light—are constant in all inertial reference frames; however, an inertial reference frame is one that is not accelerating, decelerating, or changing direction. What about those? Are the laws of physics constant in non-inertial reference frames?

- If they are not, then Einstein's case against the substantival view is weakened. If the laws of physics are different in non-inertial reference frames, then it could be because those frames are accelerating in relation to space itself. So, general relativity is Einstein's attempt to explain how the laws of physics, including the speed of light, are constant in all reference frames—including non-inertial ones.

- At first, it seems that the laws of physics are different in non-inertial reference frames. Contrary to Newton's first law of motion, things don't remain at rest in non-inertial frames: They fly all over the place. However, this is not that unusual. This kind of discrepancy can be found in inertial reference frames, too.

- Einstein suggested that the effects of acceleration could be described and accounted for by exactly the same laws as gravity. In short, the effects of acceleration are indistinguishable from the effects of gravity, and vice versa. In effect, you can mimic the effects of gravity with acceleration, and you can mimic the effects of acceleration with gravity. If so, the laws of physics are constant in all reference frames—not just inertial ones.

- It turns out that Einstein was right. It was once assumed that heavier objects would fall faster than lighter objects—that a rock twice the size of another rock would fall twice as fast—but this is not the case. Two rocks of any size will fall at the same rate. Gravity mimics the effects of acceleration, and acceleration mimics the effects of gravity.

The Bending of Light and Time Dilation

- Two very important things follow from the equivalence between the effects of acceleration and gravity. The first allowed Einstein's theory to be successfully confirmed during a solar eclipse: that light bends around massive objects. How did Einstein figure this out? If acceleration and gravity are indistinguishable, then we can figure out how gravity affects light by figuring out how acceleration affects light.

- Because the effects of acceleration are identical to the effects of gravity, light should curve toward massive objects that produce massive gravity. The amount of acceleration needed to mimic the force of gravity on the Earth does not bend light very much—and, therefore, neither does the Earth. However, the Sun is a much more massive object, its gravity is much stronger, and thus it should bend light rays significantly.

- So, when Einstein was trying to prove his theory, the best opportunity was presented by the Sun—specifically, a solar eclipse. To test his theory, an eclipse was predicted, and a star was found that would be behind the Sun but close to its edge. Newton's laws, which suggest that light always travels in straight lines, predicted that you would not be able to see the star. Einstein predicted that the light from the star would bend around our Sun and still be visible.

Einstein was right; the star was visible. This effect is now called the gravitational lens effect.

- We can also derive the effects of acceleration on the passage of time. For example, the acceleration of a ship causes time to pass more quickly at the front of the ship than at the back. But recall that the effects of acceleration are identical to the effects of gravity. Accelerating pulls your body backward, just like placing a massive object behind you would pull your body backward. So, it must be that if there are massive objects behind you (or underneath you), time passes more quickly the farther away you are from that object.

The Curvature of Space-Time

- With both time dilation and gravitational lensing in mind, we can now understand what Einstein is talking about when he talks about space-time and what it means for space-time to be curved. Take light, for example. The speed of light is constant, and nothing can travel faster than it. As a result, the path that light takes between two points must, by definition, be the shortest path between those points. If there were a shorter path, something else could travel there faster in violation of the "nothing faster than light" principle. And the shortest path between two points is also, by definition, a straight line.

- So, light must always travel in a straight line through space; however, light curves around massive objects, like the Sun. How can it be that light always travels in a straight line and yet also curves around massive objects? The answer is that space itself must be curved.

- We can say something similar about the effect of gravity on time. Think about the standard three dimensions that we encounter every day. Take a single mathematical point that has no dimensions. If you stack up a whole collection of those points, you get a line.

- A line has one dimension: length. Extend that line by stacking up a bunch of lines together outside that dimension, and you get a square. The square has both length and width. Extend the square into the third dimension to get a cube that has length, width, and height. These are the standard three dimensions in which we move. But we also move in time. Stack a bunch of three-dimensional objects, like a cube, into another dimension, and you would have a four-dimensional object, one extended through time.

- The fact that clocks farther away from a gravitational source tick faster than those closer to the gravitational source seems to indicate that the clocks that are farther away from the gravitational source are traveling farther through time. In the same way that a car going 60 miles an hour traverses a farther distance than one going 30 miles an hour, a clock farther away from a gravitational source seems to traverse more time. Therefore, it seems that gravity not only warps space, but also warps time.

- And this seems to suggest that time is a substance—something that can be warped and traversed, something that collects more densely around the source of gravity, making it thicker and harder to traverse, whereas it is more spread out and thin the farther away from the source of gravity, making it easier to traverse.

- But because the effects of massive objects and acceleration affect both the nature of space and time in a similar way, Einstein spoke as if space and time were interrelated; in fact, he spoke as if they were one entity on which gravity seems to have an effect. Gravity warps space-time, causing both light to curve around massive objects and clocks farther from gravitational sources to move more quickly.

- But this is not an entirely accurate explanation. Einstein's general theory of relativity did away with the need to hypothesize the existence of gravity at all. The Earth orbits the Sun not because gravity holds it in place, but because the mass of the Sun curves the space-time around it—the space-time in which the Earth travels. If the Sun were not there, space-time would be flat, and the Earth would continue on in a straight line. But thanks to the Sun, the space-time in which that line exists is curved, so we keep going in circles.

Realism versus Instrumentalism

- There are two views in the philosophy of science about how to understand and interpret scientific theories, especially those with hypothetical entities that cannot be directly observed: realism and instrumentalism. Consider atomic theory, which suggests that all matter consists of tiny particles called atoms that are combined and configured in different ways.

- There are two possibilities. One is that atoms exist as hypothesized, and the reason for accurate results when the theory was tested is because they behave as the theory suggests. This is the realist view. Another possibility is that the hypothesis merely produces accurate predictions, but does not actually describe the way the world is. Atoms don't actually exist, but hypothesizing that they do is a useful tool—an instrument—for making predictions. This is the instrumentalist view.

- Einstein seemed to favor an instrumental view of space-time. Hypothesizing the existence of space-time, and speaking as if it actually exists, is a very useful way of making predictions about how light and objects behave. But we need not think that it accurately describes the way the world is—that space-time exists as a substance. Ultimately, it could be that the curvature of space-time isn't an intrinsic property of a substance, but just a way of expressing the way the objects in the universe relate to one another. Light bends around the Sun not because space-time is curved, but simply because that is how light relates to the Sun.

- Although we can actually observe atoms, we will likely never be able to observe space-time. While there may someday be a way to settle the issue, there are currently good reasons on both sides that keep the issue up in the air. The relational model is simpler in a scientific sense because it has to assume less—it hypothesizes fewer entities. It does not treat space-time as a substance. On the other hand, the substantival view seems to have very wide scope—strong explanatory power—and that is a huge mark in its favor. Which view you favor depends on your metaphysical leanings.

The Block World and Free Will

- Regardless of whether you accept the relational or substantival view, relativity still entails the temporal ontology that is incompatible with free will. Recall that simultaneity is relative to reference frames. Relativity produces a picture of the universe that shows it to be a giant four-dimensional block—a collection of objects and events spread out through space-time that bear certain relations to one another.

- You can think of those objects and events as being situated in space-time, like the substantival view would suggest, or you can simply think of them as bearing relations to one another. Regardless, relativity suggests that all of the events in the entire history of the universe coexist in a giant space-time block.

- If there were a privileged reference frame that accurately described when objects came into existence and events occurred, we would not be committed to this view, but there is no such reference frame according to relativity. So, we are committed to the block worldview—omnitemporalism—which suggests that the future exists before it occurs. This view of time is incompatible with human free will, at least the libertarian variety, because it entails that we can perform no actions other than the actions that exist in the block.

Suggested Reading

Dainton, *Time and Space.*

Einstein, *Relativity.*

Kosso, *Appearance and Reality*.

“Minkowski Diagram,” *Wikipedia.*

Rosenberg, *Philosophy of Science*.

“Visualization: Minkowski Diagrams,” *Brown University.*

Questions to Consider

1. Are you an instrumentalist or a realist about science? Do scientific theories describe the world as it actually is, or are they just useful tools for making successful predictions?

2. Are you a substantivalist or a relationalist about space-time? Is space-time really a substance in which light travels and that is bent by massive objects? Or is it simply the case that speaking as if this were true is a convenient way to describe the relationships between objects?

3. An object that is rotating is in a non-inertial reference frame. Thus, its motion replicates the effects of gravity. If we ever build spaceships, we could simulate gravity by making those ships rotate in a circle. (For a cool example of this, see the film *2001: A Space Odyssey*.) How might this fact about relativity explain Newton's spinning bucket phenomenon? Does solving the bucket problem with relativity commit one to a substantival view of space-time?

Black Holes, Wormholes, and Time Travel

Lecture 20

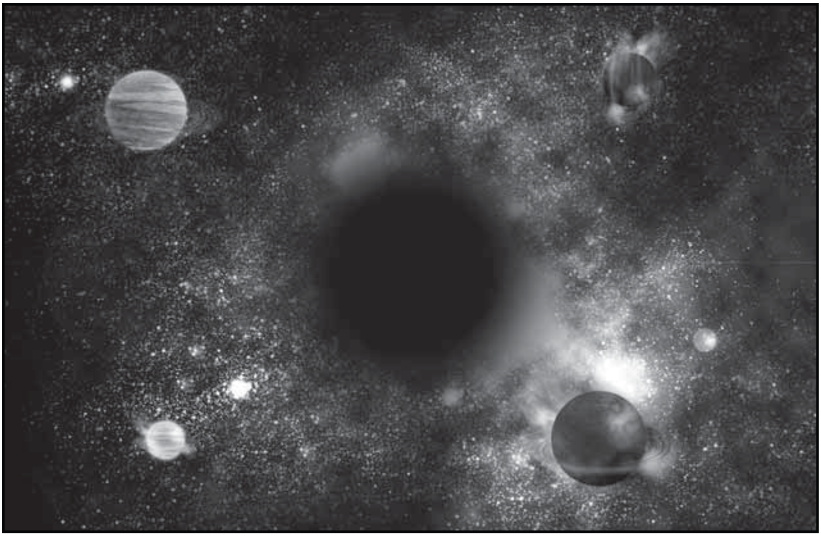
Is it possible to travel in time the same way that one travels in space? This question is too simplistic; it's like asking if we can travel in space. Of course we can. The interesting question is what kinds of limits exist regarding how we can travel in space. For example, can the rate at which we travel in time be altered? If so, can we have voluntary control of that rate? Can we change the direction through which we travel in time? Can we travel to the past? Can we skip over moments in time to arrive directly at some distant future or distant past moment?

Black Holes

- Can the rate at which we travel in time be altered? The answer to this question is yes. Objects move through time more slowly the closer they are to a source of gravity. The closer you are to a massive object, the slower time passes. And the more massive the object, the slower time passes. So, if you could get as close as you can to a really massive object, time would pass very slowly for you while it would pass comparatively quickly for others. Where might we find such massive objects?

- At the center of galaxies are black holes, which are objects so massive—and, thus, bend space-time to such a massive degree—that if anything gets too close to them, including light, it cannot escape. That is why they are called black holes. We can't see them; they neither emit nor reflect light because they pull all light in.

- You can't get too close to a black hole; otherwise, you get sucked in and can never escape. But if you could take a spaceship and orbit around the event horizon of a black hole, the area beyond which nothing can escape, you would experience extreme time dilation. To those in the outside universe, it would seem as if you were almost frozen, but you would experience time passing normally. Once you emerged from the event horizon, you would find that much more



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If you could orbit around a black hole, you would experience extreme time dilation.

time had passed in the universe than you had experienced while orbiting the black hole. The longer you orbited, the greater time difference there would be between your experience and that of the rest of the universe, so you could even have control of how far in the future you traveled. Unfortunately, this is not a feasible method of time travel.

- Another possible way to experience time dilation is with what Newton called a mass shell. Basically, a mass shell is a massive sphere with a hollow center. The closer you are to a massive object, the slower you travel through time; this effect is more significant the closer you get to its center of gravity. If you were to dig down 20 miles into the Earth, you would actually experience time more slowly than people on the surface. The problem with this method, beyond the extreme difficulty of hollowing out and traveling to the center of the Earth, is that the Earth is just not massive enough to give you a pronounced effect. Unfortunately, a mass shell massive enough to get significant time dilation would likely just collapse in on itself, forming a black hole.

- Another method for traveling into the future can be derived from special relativity. Someone traveling in a spaceship away from the Earth at near the speed of light who then turned around and came back at near the speed of light would return to find that more time had passed on Earth than he or she had experienced in his or her travels. This is sometimes referred to as relative velocity time dilation or the twin paradox. This method of time travel is not presently feasible—we have no such ship, it would have to go really fast for the effect to even be moderate, and you'd end up wasting most of your life traveling in the process.

Wormholes

- Time travel as it is conventionally conceived involves skipping over moments in time, directly traveling from the present to the future—and then back to the present. Fortunately, relativity does suggest that such time travel is theoretically possible.

- A possible method of time travel that, although currently technologically impossible, might one day be possible is called a wormhole, and it's best understood with a metaphor. Think about a two-dimensional piece of paper with two dots. The shortest distance between those two points is represented by a straight line drawn on the piece of paper, but only if the paper remains flat. If you were to bend the paper into the third dimension so that the dots touched, you could travel between them directly, bypassing the line connecting the two points on the paper.

- The idea behind a wormhole is that space-time could be bent in exactly the same way. We could bend it through a higher dimension, often called hyperspace, so that different points of space-time touch and allow instantaneous travel between them. We could not only use this to travel great distances in space, but also to different moments in time.

- The good news is that we don’t have to create wormholes because they actually happen all the time. The bad news is that they are super tiny—smaller than subatomic particles—and they blink in and out of existence so quickly that not even light can travel through them. However, if we could somehow find a way to enlarge an already existing wormhole and keep it open, we could use it as a time machine.

- Will we ever do this? The goal of those who study such things is simply to demonstrate what is consistent with relativity. Of course, physical or technological limits may prevent us from ever accomplishing this. However, there may also be philosophical limits—logical limits—that prevent such time travel, specifically time travel into the past.

The Grandfather Paradox

- Logical arguments against the possibility of time travel rely on the most fundamental axiom of logic: the law of noncontradiction. Contradictions are statements that suggest that a proposition is both true and false at the same time. The law does not merely state that contradictions happen not to be true; rather, it states that it is not possible for any contradiction to be true.

- In the vernacular of possible-worlds talk, there is no possible world in which a contradiction is true. The truth of this law stands behind all logic, reasoning, and argument. Everything we have learned as a species, and our ability to communicate at all, assumes the truth of the law of noncontradiction.

- The possibility of time travel seems to entail the possibility of a true contradiction. The argument that points this out is called the grandfather paradox. If you can travel into the past, then you can travel to a point in time before your grandfather met your grandmother, and subsequently, you could kill your grandfather. Consequently, your father will never be born, and you will never be born. However, if you are never born, then you cannot travel back in time to kill your grandfather. Time travel seems to make it possible that you both exist and you don't exist—that you both kill your grandfather and you don't.

- You can't solve this paradox and make time travel possible by simply deciding not to kill your grandfather. This is how science fiction sometimes avoids dealing with this paradox, but the law of noncontradiction doesn't merely state that contradictions aren't true—it says that they're not even possibly true. Because it seems that time travel makes it possible for you to kill your grandfather, then time travel makes it possible for a contradiction to be true—and that violates the law.

- But some philosophers, such as David Lewis, have argued that this paradox can be solved, and not by denying the law of noncontradiction. That would make the edifice of all knowledge crumble. David Lewis argued that if you were to travel into the past, certain actions would be impossible to perform. If you were to attempt to kill your grandfather, then you would necessarily fail.

- The ability to time travel to the past would not enable you to change the past. If you will travel to the past, the actions you will take when there have already occurred—they are already a part of your time line, or the block. You can observe the past and participate in the past, but you cannot change it. In fact, if you go back in time with the intention of preventing a historical event, not only will you be unable to—because the action of you failing to do so is already written in the block—but you might discover that you are in fact the cause of it.

Causal Loops

- There's another paradox to consider. To understand it, we need to first realize that time travel would make causal loops—situations where A causes B and B causes C, but then C causes A—possible. For example, if a past event causes you to be fascinated with it, but your fascination with the event causes you to travel in time to observe it, and then you end up causing it, then your fascination causes the event, and the event causes your fascination: a causal loop.

- Causal loops could lead to what's called jinn: complex objects or ideas that have no origin. Suppose that you find a time machine buried in a mineshaft. You figure out how it works and then use it to travel to the past, where you find someone, teach him or her to make the time machine, and then tell him or her to bury it in the mineshaft. Who invented the time machine? Where did the idea originally come from?

- A similar problem shows that time travel makes it possible for you to create yourself. If such paradoxes can be resolved, time travel might help us make sense of what it means for something to be a self-caused entity.

Alternate Time Lines

- There actually is one version of paradox-free time travel, although some might contend that it's not really time travel at all. There are reasons for believing that there is more than one universe—that the reality that exists is a multiverse. One conception of time travel suggests that if you were to travel to the past, you would not travel to the past of your own universe, but to the past of a universe identical to yours up to the point that you appear in the past. In fact, the act of time travel might be responsible for the creation of that universe.

- If so, it is not possible to travel into your own past and kill your own grandfather, but it is possible to create a new universe with a past identical to your own up to a certain point, and then make that universe's history turn out differently. For example, in that universe, you could kill that universe's version of your grandfather and, thus, prevent a version of yourself from ever being born in that universe. But because you were born in a different universe, it would not paradoxically prevent your own existence.

- There would not be jinn in a multiverse in which such time travel was possible. If you found a time machine in a mineshaft and traveled back to explain to someone else how to build a time machine, you would not be caught in a causal loop. You would just simply be creating a universe in which some other person learned from you how to make a time machine.

Suggested Reading

Hudson and Wasserman, "Van Inwagen on Time Travel and Changing the Past."

Luck, "Time to Be a Hero."

Lewis, "The Paradoxes of Time Travel."

Toomey, *The New Time Travelers*.

Van Inwagen, "Changing the Past."

Questions to Consider

1. If you could travel in time, where would you go? Who would you want to meet? What events would you want to see? Given what we have discussed, could you change what happened? Could you end up causing it?

2. How comfortable are you with causal loops? Can something be the cause of itself in the way that is described in the lecture? Could the possibility of causal loops explain how God could be a self-caused being?

Quantum Mechanics and Wave-Particle Duality

Lecture 21

Quantum mechanics tells us that some events have no cause and that particles can come into existence from nothing. The goal of this lecture is to help you figure out what quantum mechanics is and what it can tell us about the nature of reality. In the process, you will learn that light has a wave-particle duality, which means that sometimes we observe light behaving as if it is made of particles and sometimes as if it is made of waves.

Quantum Mechanics and Probability

- Quantum mechanics is the study of the atomic and subatomic world—that which is the world of things the size of atoms and smaller. It studies its nature, properties, and behavior. Quantum mechanics is the most highly confirmed, proven, and successful theory in all of science. For ease of reference, everything larger than atoms—bodies, cars, and even microscopic things like molecules and germs—is considered medium-sized objects.

- To understand quantum mechanics, we first have to discuss probability; specifically, we need to clarify the difference between subjective and objective probabilities. Statements of subjective probability express one's confidence that a particular event occurred or that a proposition is true. Usually, they are based on a set of information to which a person has access. Subjective probabilities are essentially statements about what someone knows. Objective probabilities, on the other hand, are statements about the world itself—not how likely something seems, but how likely something is.

- Subjective probabilities are statements about how likely something is given what we know, and objective probabilities are statements about probabilities given the way the world is. Subjective probabilities are, in a sense, statements about the quality of our information. Objective probabilities are a feature of reality.

Wave-Particle Duality

- Quantum mechanics shows us that there are some events that are truly random and occur without a cause, such as radioactive decay, but it also tells us that the fundamental nature of reality is different than it intuitively seems. When we look at the world around us, the world of medium-sized objects, everything seems solid. Everything has a location, momentum, and a cause behind the properties it has. So, it seems that the same thing is true for the particles that make up medium-sized objects. But quantum mechanics tells us that on the atomic and subatomic levels, things are different.

- Before quantum mechanics came along, we already knew that certain things in the subatomic world were different. For example, we thought that the fundamental nature of light was wavelike—that light consisted of waves, like sound, not particles.

- The most famous example that shows that light is a wave is called the double-slit experiment. Take a light source and shine it on a wall. Then, take a divider, cut two vertical slits in it, and place it between the light source and the wall. This will change the way the wall is lit by the light source. If you place the divider a certain distance from the wall—a distance that bears a certain relation to the distance between the slits—then you will get what's called an interference pattern, the same kind of interference pattern that is observed when two sound waves interact. The two slits divide the light into two waves that then interfere with one another and thus create an interference pattern. So, because light behaves like a wave, it was concluded that its nature was wavelike.

- What started to cause problems was when we realized that other experiments proved that light was not wavelike, but made of particles. This happened when Einstein explained the photoelectric effect. The atoms of metal objects have electrons in their outer shell that can be fairly easily ripped away by interactions with light, but only under certain conditions. Those conditions, and how much energy they have when they are ripped away, are consistent with light being made of particles and are inconsistent with it having wavelike properties. Why?

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Experiments have shown that light has a dual nature: It is both a wave and a particle.

- Shine a light on a piece of metal and measure the energy of the electrons that are given off. If light is a wave, then the brighter the light is, the more energy you would expect the electrons to have. Why? If light is a wave, then brighter lights would emit higher-amplitude waves, which would have more energy, and waves with more energy would kick off electrons with more energy.

- However, this is not what happens. Whether electrons are given off at all has nothing to do with the brightness of the light, but has everything to do with the color. In addition, the energy of the electrons given off is also determined by the color of the light. The higher up on the spectrum the color is, the higher the energy the emitted electrons have.

- If light is a wave, a brighter light would mean that waves with larger amplitude and energy would produce higher-energy electrons, but what actually happens is exactly what we would expect if light is made of particles—what are now known as photons.

- If light is made of particles, light lower in the spectrum would have particles with less energy. But once the spectrum of light reaches a certain point, such that the amount of energy in each photon is greater than the force holding the electron in place, the photons will start kicking out electrons. Because at this point they just barely have enough energy to counteract it, the energy of those electrons will be really low. But as the light moves up the spectrum, the photons get more energy, so they kick off those electrons with more force, and thus, the electrons have a higher energy.

- Making the light brighter increases the number of photons and, therefore, increases the number of electrons ripped away, but making the light brighter does not change the color, and thus, it does not change the photons' energy. Therefore, the energy of the electrons emitted also remains unchanged.

- In short, if light is made of waves, then the energy of the electrons would be determined by the light's brightness. If it is made of particles, then it would be determined by its color. Because it's determined by its color, light is made of particles.

- So, the two-slit experiment shows that light is a wave; the photoelectric effect shows that it is a particle. This is the wave-particle duality of light. It seems to be both. But the problem is that the properties of waves and particles are inconsistent. If light were made of particles, it would behave a different way in the two-slit experiment. If it were made of waves, it would behave a different way than it does in the photoelectric effect experiment. So, it seems that it can't be both, but it is.

Surfing Particles

- Why can't it be both? Why can't light consist of particles that are riding on waves, like little surfers? Wouldn't that explain both experiments? The photons riding on the waves could eject the electrons from the metal, but the waves in which they are riding could interfere with each other in the two-slit experiment. A very sophisticated version of this theory was developed by the theoretical physicist David Bohm, whose version might work, but this simple "surfer" solution doesn't work.

- Suppose that we set up an experiment where we shine a light through what physicists call a half-silvered mirror, which is actually just an ordinary two-way mirror, like the ones you see in the interrogation room in cop shows. When you shine the light through it, it splits the light wave in half, and half of the photons emitted from the light will reflect off the mirror and half of them will go through it. We then set up two additional regular mirrors, one on either side at a distance and an angle to the two-way mirror. They will reflect both streams of light to a single location on a distant wall.

- So, a particular photon might travel through the two-way mirror, bounce off the mirror on the left, and hit the wall, or it might reflect off the two-way mirror, bounce off the mirror on the right, and then hit the wall. The objective probability of any particular photon's path is 50-50. There is no way to determine beforehand which path it will take.

- If we turn on the light with both regular mirrors in place, we will get an interference pattern. If we take either one of those mirrors away, we will get a noninterference pattern—basically, a single dot. And this is all true no matter how dim we make the light. Let's say that we put a photoreceptive cell on the wall that is sensitive enough to record even one photon, and we turn the light down so dim and turn it on and off so quickly that it only emits one photon.

- If we do this once a day, every day, for a year, with both regular mirrors up every time, we will get an interference pattern. This makes sense on the surfer theory. Even if only one photon is being emitted, the light wave would still divide at the two-way mirror, both halves of it would reflect off either mirror, and they would reunite before they hit the wall and interfere with each other.

- If we do one photon a day every day for a year but with only one of the regular mirrors up, we will get a noninterference pattern—a dot. Again, this makes sense. Subtracting one of the regular mirrors would prevent one half of the light wave from reaching the wall, so it couldn't interfere with its other half.

- But we have no way of knowing, if we leave both regular mirrors up, what path any particular photon took to get to the wall—which half of the wave had the photon. Did it go through the two-way mirror and take the left path, or did it reflect off of it and take the right? We have no idea.

- So, suppose we put very sensitive detectors on the two mirrors so that we can tell which mirror suffers an impact and, thus, which mirror reflected a photon. We could then tell which path the photon took in each case.

- If we did that, and the surfer hypothesis is right—light is just photons traveling on light waves—then we should see no change in the pattern on the wall. Both halves of the light wave would still reach the wall by bouncing off both regular mirrors and interfere with each other. We would simply know which half of the light wave contains the photon.

- But that is not what happens. If we make that measurement and determine which path the photon takes, even though we left both regular mirrors up, the interference pattern disappears. If we did that every day for a year, we would end up with two noninterference patterns—basically, two dots—one created by the photons that took the left path, and one created by the photons that took the right path.

- As long as we are not measuring the light for particle properties, it has wavelike properties, so we get an interference pattern. But as soon as we measure for the particle, we make it take on particle properties, all the wave properties of the light disappear, and we lose the interference pattern. This is what quantum physicists think happens.

- In a way, this is helpful. Wave and particle properties are incompatible, so light can't have both at once. And it doesn't. It has particle properties under some conditions, and it has wave properties under others, but never both at once. Light has a dual nature.

- Double-slit experiments with over 100 kinds of particles have been conducted, even with atoms themselves, and we always get an interference pattern. In fact, we have even done it with molecules that contain up to 114 atoms—and we still get an inference pattern. So, it looks like quantum mechanics is not only about the atomic and subatomic world; it seems that all matter in the universe has a wave-particle duality.

Suggested Reading

Kosso, *Appearance and Reality*.

Rosenblum and Kuttner, *Quantum Enigma*.

Skyrms, *Choice and Chance*.

Squires, *Mystery of the Quantum World*.

Questions to Consider

1. It seems that there is a less-than-certain objective probability that certain things will occur at the quantum level, such as the decay of a radioactive atom. Is there anything else in the world whose probability is less than certain in an objective sense? If so, is the fact that it has such a probability just a result of the fact that it's a product of a quantum event? Is any other kind of event, besides quantum events, truly objectively random?

2. Given what you have learned so far, how would you describe what is going on at the quantum level?

Quantum Mechanics, Spin, and Spooky Action

Lecture 22

Wave and particle properties are incompatible, but quantum mechanics suggests that quantum particles have wavelike properties until they are measured, in which case they take on particle properties. This is a metaphysical conclusion because it tells us about the nature of matter. But quantum mechanics doesn't stop there. It turns out that certain particle-like properties, such as location and momentum, are mathematically incompatible on the quantum level. It's impossible for a quantum particle to have both location and momentum at the same time. This is called the Heisenberg uncertainty principle, and it was discovered by Werner Heisenberg.

The Heisenberg Uncertainty Principle

- The equations governing the Heisenberg uncertainty principle show that a fundamental particle, such as an electron, cannot have both a specific position and a specific momentum at the same time. You can measure one, or the other, but you can't measure both.

- This is not subjective; it's not merely a fact about what we know. It's not as if an electron has both position and momentum but we can only determine one property at a time. It's that it can only have one of those properties at a time. In addition, it doesn't have either one of those properties until we measure for it—until we collapse the wave into a particle.

- If an electron is not being measured, it has neither location nor momentum. We can lay down probabilities for how likely it is that it would take on a particular location if we measured it, but if we are not measuring it, it has no location. The probabilities we are talking about are not subjective—they are objective. There is a fact about how likely it would be in a particular location if measured, but there is no fact about where it actually is; it has no location unless measured. The same is true for momentum.

- The way quantum physicists describe the electron when it is not being measured is as a probabilistic wave function. It's a wave that contains information about how probable certain particle-like properties, such as momentum and location, are. The term for this is superposition, which basically means that the many possible states the electron could be in coexist.

- Physicists say that an electron is in a superposition of not having any particular location or momentum, but certain locations and momentums are more probable. There are facts about what location or momentum the electron would likely take on if measured, and those probabilistic facts are a part of the world. These are, in the most direct way, objective probabilities—facts about the world.

The Hidden Variable Theory

- When quantum mechanics was first being discovered, some physicists couldn't accept that it suggested that events are uncaused and that certain properties are not had by quantum particles until they are measured. There must be some hidden information—a hidden variable—that determines such things. Along with Boris Podolsky and Nathan Rosen, Einstein proposed a thought experiment, called the EPR experiment, and attempted to show that there must be hidden variables.

- The property of spin is one of those properties that quantum mechanics says that a quantum particle does not take on until you measure for it. To be clear, subatomic particles don't actually spin—they just have certain electromagnetic properties that make them behave, in certain circumstances, as if they were spinning. You can just think of the spin of a particle as the direction it is spinning on one possible axis.

- According to quantum mechanics, before it is measured, a subatomic particle has indeterminate spin. It is equally likely that it is spinning on any axis—a vertical axis, a horizontal axis, or any number of diagonal axes—and for any axis it could be spinning on, each direction it could be spinning on that axis is equally likely.

- Einstein and his colleagues believed that the particles must have a spin before being measured. Let's say that you have an atom that has zero spin. But then it gives off two particles, each of which has nonzero spin, and the two particles speed off in opposite directions. This actually happens in nature all the time. We know that the spin the two particles have will always be opposite. If one has a vertical-up spin, the other one will have a vertical-down spin. This is undeniable and uncontested. Spin is always conserved. If what quantum mechanics says is true, which of the two particles has spin up and which one has spin down is indeterminate until a measurement is made.

- Einstein and his colleagues suggested that it can't be the case that particles are taking on a spin at the moment of measurement. The particles must have a spin before they are measured. Otherwise, there is this "spooky action at a distance" that violates relativity. Basically, at the moment they are emitted, the particles must take on a spin, and they merely demonstrate that spin when they travel through a measuring device. Their spin must merely be hidden—a hidden variable.

- Einstein was wrong about something: There can't be hidden variables; thus, the particles can't have a spin until they are measured. Irish physicist John Bell proved it mathematically, although, ironically, he was trying to prove Einstein right.

- Quantum mechanics and Einstein's hidden variable theory give us two different predictions. In quantum mechanics, the particles don't have a spin until they are measured, but we can represent the relationship between their spins mathematically. In quantum mechanics, the probability that particle B will spin opposite particle A when they are being measured on axes that differ by 120° is 25%.

- But in the hidden variable theory, the probability is that they will be opposite at least 33% of the time. Without even performing Bell's version of the experiment, we know that the hidden variable theory is incompatible with quantum mechanics. Quantum mechanics dictates a 25% probability, but the hidden variable hypothesis predicts at least 33%.

- What's even more damning for the hidden variable theory is that you can actually perform this experiment in the real world, and the two theories make completely different predictions about what you will observe. Physicist Alain Aspect did the experiment in the early 1980s, and it turned out to be 25%. Thus, the hidden variable theory is defeated; quantum particles do not have spin until they are measured.

The Copenhagen Interpretation

- What are we to make, metaphysically, out of particles not having spin, location, or momentum until they are measured? What are we to make of the fact that they are in a superposition such that certain spin orientations, locations, and momentums are probable but not definite? What are we to make of what quantum mechanics is supposedly telling us about the nature of the quantum world? How are we supposed to understand what a probabilistic wave function is?

- The first interpretation was called the Copenhagen interpretation, named after where it was first articulated. It was the orthodox interpretation for a very long time, but it has come under heavy criticism lately. It's actually pretty difficult to articulate because there's not universal agreement about what it amounts to even among those who subscribe to it.

- It begins by admitting that quantum mechanics is complete. There are not any hidden variables that assign a particular spin or location to quantum particles when they're not being observed; particles really are in a superposition. But when we do make observations, the superpositions collapse into particles that take on what we might call classical properties, properties derived from classical Newtonian physics. These are properties that medium-sized objects have, like location.

- If we stopped there and embraced the idea that wave functions can exist, even without classical properties, we could now understand a number of things that previously might have seemed unclear, including how particles can pop into existence from nothing. So, if we don't press further, quantum mechanics does give us knowledge of the way the universe is—there are facts about the probabilistic properties that wave functions have.

- But those who subscribe to the Copenhagen interpretation have very instrumentalist tendencies. Instrumentalism in philosophy of science is the idea that scientific theories do not describe the way reality is, but are merely useful tools for making predictions. Most who push the Copenhagen interpretation push this view. They suggests that theorizing the existence of wave functions is a useful tool for making predictions about experimental results, but it doesn't actually tell us the way the world is. This is disappointing to say the least—we want to know the way the world is—but there are also a few problems with it.

- First, those who suggest this seem to be doing so only because they don't like the description that quantum mechanics gives of reality. Another problem is that this view was motivated by logical positivism—the idea that statements are only meaningful if they can be observationally confirmed.

Schrödinger's Cat

- Another problem is exposed by the famous Schrödinger's cat thought experiment. Take a cat that's been given a sleeping pill so that it can't make any conscious observations, and put it in a box. Attach that box to a device that could emit poisonous gas into the box, and attach that to a device that can measure the spin of particles, but don't let it display its result to us. Hook it up so that if the device registers a spin up, the gas will release, but if it measures a spin down, it won't. Then, inject a particle with indeterminate spin into the measuring device.

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A possible explanation to the problem of Schrödinger's cat is that the cat is in an indeterminate state of aliveness and deadness.

- The spin of the particle is indeterminate until we measure it, and because the measuring device doesn't display its result, it will remain in a superposition, and thus, the particle's spin will be indeterminate. It will be indeterminate whether the gas was released and, therefore, indeterminate whether the cat is alive or dead.

- And if quantum theory doesn't tell us facts about the way the world is, but is merely a useful tool, then there is no fact about whether the cat is alive or dead. But this is absurd—there must be a fact about whether or not the cat is alive or dead, so there must be something wrong with the instrumentalist's leanings of the Copenhagen interpretation.

- But even if we reject instrumentalism and think that the properties of wave functions describe reality, Schrödinger's cat still raises problems. What could it mean for it to be a fact of reality that the cat is in an indeterminate state of aliveness and deadness? We think we can make some sense of what it means for an electron to be a probabilistic wave function, but what would it mean for a cat to be a probabilistic wave function?

- Then, it gets even weirder. If we opened the box, we will see either a dead or alive cat—that will be our measurement that makes the wave function collapse. This is similar to when we observed which mirror the photon hit in the two-way mirror experiment, which caused the wave function to collapse. But what's so special about observation? How can observation change reality like this—how can it collapse a wave function?

- Some have thought to solve this problem by suggesting that it's not observation but interaction with the measuring device that causes the wave function to collapse. So, in the Schrödinger's cat example, the spin-measuring device collapses the wave function into a particle with a particular spin, even though we didn't know which one. Thus, there was a fact about what spin it had and, thus, a fact about whether the cat was alive or dead.

- The problem is that we can prove experimentally that interactions with measuring devices don't collapse wave functions; to collapse it, the results of measurements have to be observed. What is so special about observation? This is called the measurement problem, and it and problems like it have given rise to many different interpretations of quantum mechanics.

Suggested Reading

Davies and Brown, eds., *The Ghost in the Atom.*

Herbert, *Quantum Reality*.

Kosso, *Appearance and Reality*.

Maudlin, *Quantum Non-Locality and Relativity*.

Questions to Consider

1. Are you comfortable accepting that something that has no location or momentum—that is not an object in any classical sense, but merely a probabilistic wave function—exists? Are you comfortable accepting that Schrödinger's cat could be in a superposition of aliveness and deadness? How does this affect your notion of what it means for something to exist?

2. Reconsider your view on the instrumentalism-versus-realism debate about scientific knowledge. Does science tell us the way the world is, or is it merely a useful tool for making predictions?

Quantum Mechanics, God, and the Multiverse

Lecture 23

The Copenhagen interpretation of quantum mechanics, which admits that wave functions collapse into one outcome or another upon observation, often takes a very instrumentalist view, suggesting that quantum mechanics doesn't tell us the way the quantum world is, but is just a useful theory for making predictions. But many scientists, unsatisfied with the notion that science doesn't discover the way the world is, have offered alternative interpretations to quantum mechanics. In this lecture, you will consider a few on the way to exploring the possibility that our universe is not the only one that exists—reality might consist of what has come to be known as a multiverse.

The Pilot Wave Theory

- One of the alternatives to the Copenhagen interpretation is the consciousness interpretation, which suggests that—because conscious observation seems necessary for quantum particles to take on certain properties—somehow the conscious event in our mind of our being aware of a quantum measurement collapses the wave function. So, in the EPR experiment, our mind causes the particle to take on a spin, although we have no conscious control over what spin it takes. Some misunderstand quantum mechanics and think that this is exactly what the theory must entail, but this is only an interpretation, and there are many problems with it.

- First, it not only assumes the existence of the mind, which is problematic to account for, but it also assumes that the mind can not only affect our bodies, but also affect quantum events. In addition, it commits us to thinking that Schrödinger's cat is neither alive nor dead until our observation collapses the wave function—but this is quite unintuitive. Lastly, if conscious observation is required to collapse a wave function, what was the universe like before there were conscious observers?

- This has caused some to hypothesize God as a conscious observer outside the system whose observations can cause wave functions to collapse, but there are significant problems with this. If God exists, then he or she knows and observes all, so all wave functions would be collapsed at all times—yet we know that they are not. To be consistent with quantum mechanics, one would have to suggest that God only observes and collapses the wave functions that we need to say are collapsed even though there is no observer around. Once we realize this, this hypothesis just looks like an ad hoc excuse to get out of a problem.

- David Bohm proposed a theory of quantum mechanics that is basically a souped-up version of the particle surfer theory, which suggested that particles exist, but they "ride" on waves, and how the waves affect the motions of the particle could explain things like interference patterns in the two-slit experiments. Bohm suggests that both particles and waves exist and that waves guide the particles.

- But Bohm's theory is different in a few ways. First, Bohm's waves aren't waves per se, but a "quantum force." Second, the particles don't ride the force but are piloted by them. The analogy that Bohm uses is a radio beacon guiding a ship. Third, Bohm suggests that the same equations that describe how quantum wave functions develop describe how the quantum force guides the particles. Combine that with our ignorance of the initial locations of particles before they are affected by the quantum force, and Bohm's theory makes all the same predictions that traditional quantum mechanics makes.

- The surfer theory faced a problem: In the two-way mirror experiment, simply measuring the path of the particle makes the interference pattern disappear. How can Bohm's pilot wave theory account for this? Bohm's quantum force is not local; it does not just "exist" in one place and does not just affect one particle at a time. Events on one end of the EPR experiment—measuring along a certain axis and the particle getting a spin—can affect the force and particle on the other end.

- But here is where Bohm runs into a problem. First, it's still not clear how an observation could cause such things to happen. Second, this would happen instantaneously, even if these locations or particles were light-years apart. Thus, it would seem that information about the quantum force in one location can travel faster than the speed of light to another location. Some argue that this violates the rule in relativity that nothing can travel faster than light, but others deny this.

The Many-Worlds Interpretation

- The most famous multiple universe theory is called the many-worlds interpretation of quantum mechanics, and it was developed by physicist Hugh Everett and later endorsed by Bryce DeWitt. A possible world is a reality that coheres to a logically consistent truth arrangement of all possible propositions. The proposition "a multiverse exists" could be true or false in many possible combinations, so there are many possible worlds that are multiverses. There is also a possible world with one universe, with two, with three, etc. What we are wondering is whether the actual world is a multiverse, and what Everett suggests is that it is.

- Furthermore, a universe is a collection of matter that is causally interrelated, but causally closed. For any given piece of matter in a universe, it can necessarily only causally interact with other pieces of matter in that same universe. (Although, events in one universe might create another.)

- Something that is really weird about quantum mechanics is the collapse of the wave function, and it's not clear how an observation of a quantum outcome could make it happen. Everett suggests that it doesn't. Your observation of the wave function doesn't collapse it; it makes you part of it. To account for what your observation does, you have to plug yourself in as a variable into the quantum equation. So, you are now in a superposition; thus, you have multiple contradictory properties at once, just like the wave function. You are in a state of both having observed the particle as having spin up and having observed the particle as spin down.

- But, of course, “you” are only aware of one of the outcomes. How can you also be aware of the other one? It would seem that this can be true only if you are split in two so that there is another “you” that observes the other outcome. And it seems that the only way that could happen is if there is another universe with another you that observes the other possible outcome. So, it was suggested that Everett’s idea entailed that human observations of measurements of quantum events create multiple universes. The two “yous” in the two universes can’t interact; they are not even aware of the other one’s existence. But they are still there.

- We have now considered three interpretations of quantum mechanics: the Copenhagen interpretation, the pilot wave theory, and the many-worlds interpretation. Basically, we can think that the mind has inexplicable ability to cause wave functions to collapse on the quantum level by observing measurements, that information can travel faster than the speed of light or backward in time, or that there are multiple universes. The multiple universe theory is the only one that doesn’t violate the laws of physics, and because the laws of physics are confirmed by our observations, it’s the only one that doesn’t conflict with our observations.

God and the Multiverse

- Interestingly, there are nonscientific reasons for believing in the existence of multiple universes. There are also theological reasons. In fact, the existence of God might itself suggest the existence of the multiverse. Many theists have started to suggest that God must have created a multiverse as a way to avoid a philosophical problem with theistic belief raised by a philosopher named William Rowe.

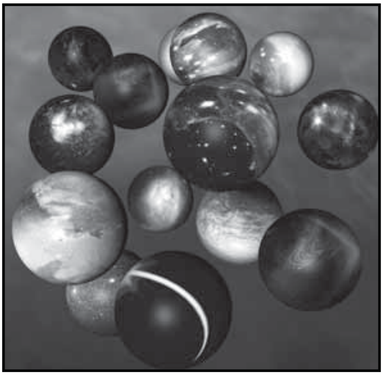
- Rowe articulates what is called the problem of no best world, which goes like this: God, if he or she exists, must by definition always do the best possible thing. So, if God created our reality, then he or she must’ve created the best possible one—the best possible world. We could stop there, and we already have a problem: This world is obviously not the best possible world. But Rowe goes deeper.

- Not only is this not the best possible world, but the very concept of a best possible world is logically problematic. For any given possible world that there could be, you could always make that possible world better. In short, there's an infinite hierarchy of possible worlds where each is better than the last, but none is the best of all. So, it's not logically possible to create the best possible world.

- If God by definition must create the best possible world, but by definition such a thing cannot be done, then by definition God cannot exist. God's existence would require him or her to do something that is logically impossible to do.

- Some theists tried to get out of this problem by figuring out a way to make the concept of the greatest possible world coherent. They attempted to do so with this suggestion. It's true that for any possible universe, it could be made better by adding one more good thing. There is an infinite hierarchy of universes.

- But suppose that God created an infinite number of those universes—what if he or she created a multiverse where each universe was better than the next but none was the best of all? The possible world that contained that infinite number of universes would be of infinite value because you would figure its value by adding up all the individual values of all the universes within it. And you can't get higher than infinity, so God could create the best possible world by creating a multiverse with an infinite number of ever-increasing-in-value universes.



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If you think God exists, then you must think that there are multiple universes.

- However, because if God exists he or she must create the best possible world, creating a multiverse would be the only way of doing so. So, if you think God exists, then you must think that there are multiple universes.

- This argument is not without its hiccups. The theist who believes in the multiverse—a multiverse theist—doesn't think that God would create all possible universes. Some possible universes would be worse than hell, and an all-loving God wouldn't create such a universe. Besides, there would be an infinite number of possible universes with negative value—you could always make a universe worse—and if you include them, they will cancel out the good ones, and the cumulative value of the multiverse would be zero. So, the multiverse theist claims, God created an infinite number of universes worth creating.

- But it seems that the concept of the greatest possible world is problematic. Even if you did create a multiverse with an infinite number of universes, you could always make that multiverse better by dropping the worst universe from it. Another problem emerges when you ask about the size of this multiverse. It's infinite, but couldn't it be bigger? No matter what order of infinity describes the infinite multiverse that a being could create, it seems that it could always be bigger and, thus, better. But if these objections can be overcome, then this theory is very useful.

Suggested Reading

Blumenfeld, "Is the Best Possible World Possible?"

"Cantor's Diagonal Argument," *Wikipedia.*

"Class (Set Theory)," *Wikipedia.*

Clifton, "Critical Notice of John Leslie's Universes."

Coughlan, "Must God Create Only the Best Possible World?"

Herbert, *Quantum Reality*.

Howard-Snyder and Howard-Snyder, "How an Unsurpassable Being Can Create a Surpassable World."

———, "The *Real* Problem of No Best World."

Inglis-arkell, "The Odd Genius Who Showed That One Infinity Was Greater Than Another."

Johnson, "The Failure of the Multiverse Hypothesis as a Solution to the Problem of No Best World."

Jones, *String Theory for Dummies.*

Kraay, "The Problem of No Best World."

———, "The Theistic Multiverse."

———, "Theism, Possible Worlds, and the Multiverse."

Langtry, "God and Infinite Hierarchies of Creatable Worlds."

———, "God and the Best."

Leftow, "No Best World: Creaturely Freedom."

———, "No Best World: Moral Luck."

Leslie, *Universes*.

Monton, "Against Multiverse Theodicies."

Moskowitz, "Do Black Holes Create New Universes?"

Munitz, "One Universe or Many?"

Schlosshauer, Koer, and Zeilinger, "A Snapshot of Foundational Attitudes toward Quantum Mechanics."

Swinburne, *Providence and the Problem of Evil.*

Turner, "The Many-Universes Solution to the Problem of Evil."

Vallentyne and Kagan, "Infinite Value and Finitely Additive Value Theory."

Questions to Consider

1. Which interpretation of quantum mechanics do you prefer, and why?

2. Do you think that suggesting that God creates an infinite number of universes worth creating solves the problem of no best world? Do you find the idea of God creating a multiverse disturbing, comforting, or something else?

3. Does the idea that we live in a multiverse change your views about your own importance or the importance of your actions? For example, suppose that you take actions to prevent some disaster—such as pushing someone out of the way of a moving train. Let's suppose that if you succeed, there is another universe just like ours where you don't—and if you don't, there is another where you do. If every possible thing happens in some universe, what does it matter, all things considered, what does or doesn't happen in our universe? What does it mean if you really never prevent anything from happening—all you can do is prevent it from happening in your universe?

Do We Live in a Computer Simulation?

Lecture 24

In this lecture, you will consider one final reason for thinking that there is a multiverse. It's possible that there is only one physical universe, but multiple computer-simulated universes—that's the kind of multiverse we might live in. And if we do, it's most likely that we live in one of the simulated universes. Because it's about 20 percent likely that we will create a simulated world—and, thus, there are billions of them—the likelihood that we live in a computer-simulated world is much higher than you probably think: 20 percent.

The Computer Simulation Hypothesis

- The existence of our mental life, our mentality, is dependent on and produced by the activity of our neurons. It is because the neurons of our brain are wired and fire in certain ways that we have the sensations that we do. Everything is produced by the activity of our brain, and all of our mental life—our thoughts, beliefs, and decisions—are reactions to what we experience.

- But the reason that we have the sensations that we do is because our organs send electrical signals to our brain. Think into the future, when we completely understand how the brain works and how it interprets the signals sent to it. Suppose that people could hijack all of your senses and hook their computer directly into your brain. They could control everything you see, hear, feel, taste, and smell. They could create an entire world for you to experience. We could call such a device an experience machine. This is actually the plot of the popular sci-fi classic *The Matrix*.

- To understand the computer simulation hypothesis, we also need to recall what we learned about artificial intelligence. The wiring and activity of your neurons could be replicated on a computer—on a large, advanced, and complex enough silicon hard drive. In addition, because we don't know what is required for consciousness—and, specifically, we don't know that being made out of carbon instead of silicon is required for consciousness—it seems that we should conclude that if the neural functioning of our brains were replicated on a computer, that activity on the computer would give rise to consciousness. It would have a mind.

- Recall also that we might not need to copy an existing person's neural configuration to produce such an artificial mind. We could use multiple techniques to produce a new, unique mind, one unlike any that exists in our universe. We would likely do this by configuring that mind the way that an infant's brain is configured, prewired to experience the world, but set it up to program itself as it learns. We could then feed the artificial mind electrical inputs, just like the ones that you receive from your sense organs, and create a world for that artificial being to experience.

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In a computer-simulated world, artificial persons could be sent electrical signals to make them think that they were alive.

- Because its silicon neurons would be firing in the same way that our carbon neurons do, it would experience the digital world that we are creating for it, just like we experience the physical world. Even if it were to look at its own brain, and study it, if we were to send the exact same kind of signals that we receive when we study our brain, it would even think that it had a carbon-based biological brain, even though it has a silicon one.

- Imagine far into the future, when we have massive computing abilities and technology. We can create multiple artificial persons, whose brains all run entirely on a massive computer hard drive and actually have no physical body. We could send them all electrical signals, making them think that they have physical bodies. We could create entire digital worlds, filled with digital people that have real minds. They could walk about this digital world and experience it as if it were a real physical world. In fact, they would even think that it is a physical world. That is a computer-simulated world.

- There are so many reasons why we would do this. Historians would find it of great use, and you could settle political disputes. In addition, simulated worlds would make great video games.

The Simulation Argument

- Philosopher Nick Bostrom argues that the likelihood that we ourselves live in a computer simulation is directly proportional to the probability that we will one day develop computer simulations ourselves. Here's why it is way more likely than you thought that we actually live in a computer simulation. First, if there ever is a simulated world, there won't be just one—there will be billions. It will be a major advance in technology, and it will likely be used for many reasons.

- A safe assumption to make is that there actually is a physical universe. If so, there are two possibilities. Either the physical universe is one in which computer-simulated worlds are never developed anywhere, or they are developed and there are billions of them.

- Because we haven't yet developed simulated worlds, we don't know which option is actually the case—whether there is just a physical world, or there is a physical world with billions of simulated worlds in it. But if we ever develop a computer-simulated world ourselves, we will know that the first option is not true, because we created a simulated world. Therefore, if we ever create a simulated world, we would know that the physical universe that exists contains billions of simulated ones.

- Then, how would we know what kind of universe we are in? Are we in the physical world, or are we in one of the billions of computer-simulated worlds? Computer-simulated worlds would look to their inhabitants just like physical worlds. The only thing we would have to go on is the odds, and the odds are that we are in a simulated world. It's a billion-to-one chance that we are in the physical world.

- So, if we ever create a computer-simulated world, we will know that there is one physical world and billions of simulated ones, so the odds that we are in a simulated world are a near guarantee. So, if we ever create a computer-simulated world, it's a near guarantee that we are in one—so, we should conclude that we are.

- The probability that we live in a computer-simulated world is directly proportional to the probability that we will create a simulated world. So, how likely is it that we would create a simulated world? There are basically five possibilities. One reason that we might never create a simulated world is that we might destroy our civilization in some way before we ever become that technologically advanced. In addition, ethical considerations might prevent us from doing so. Additionally, we might just lose interest in creating computer-simulated worlds. Furthermore, there might simply be technological limitations that prevent us from creating computer-simulated worlds. Finally, there is the possibility that we actually could and will develop computer-simulated worlds.

- We don't know which scenario is most likely, and we really have no reliable information to make such a prediction. But when you are working with subjective probabilities, a lack of information does not prevent you from laying down probabilities. If you have no information to make one hypothesis more likely than the other, then you just give each hypothesis an equal probability. Because there are five, that would mean that each scenario is 20 percent likely.

- But that means that it is 20 percent likely that we will one day create computer-simulated worlds. However, if we one day do that, it will be a near guarantee that we live in a computer-simulated world. So, we are forced to conclude that, given what we know, the probability that we live in a computer-simulated world is 20 percent. Now, that's not enough to conclude that it actually is true that we live in a computer-simulated world, but that probability is probably much higher than you thought. It's not just a logical possibility that can't be 100 percent disproven; there's actually a decent chance that it's true.

- Some people have said that they have seen "glitches" that indicate that we are in a computer-simulated world. This seems unlikely. Even if the world is real, our senses aren't very reliable—and, after all, the designer of our universe could always just erase our memory of such glitches if he or she wanted to.

- One fascinating argument that suggests that we live in a computer-simulated world is based in quantum mechanics. The computing power to keep track of everything that would be happening in a universe the size of ours, all the way down to the quantum level—where every particle is and how fast it's moving—would be enormous. But it would also be unnecessary. Only when we get sophisticated enough to start taking measurements at the quantum level would the computer need to bother with ascribing properties to quantum particles.

- But could this be why quantum particles don't have certain properties until they are observed by us—because the computer doesn't bother to give them properties until we observe them? Is this why they are a probabilistic wave function before they are observed—because the computer only bothers calculating where they would likely be if they are observed? Is this why mathematical equations are the best way to describe the quantum level—because really it just is a mathematical equation being run on a computer? Is this why a particle can't have both location and velocity at the same time—because the computer can only assign one at a time?

- What if we are living in a computer simulation? Interestingly, the point might be that it doesn't matter. If you care about knowing the true nature of the world, it matters—so metaphysicians care. Science has already taught us that the universe is very different than what our common sense suggests, so the realization that the world is digital might not be that revolutionary. Ultimately, it might not matter for everyday life.

- After all, even if we are simulated persons, we are still persons—we are minded. We experience pain, have emotions, and thus have rights and obligations. If we live in a simulated world, we would still be bound by all the same moral rules. We should still behave exactly as we should behave.

- In fact, if we have good reason to believe that we live in a computer simulation, perhaps the only way we should modify our behavior is by not talking about the fact that we live in a computer simulation. Whoever is running the computer simulation might only be interested in it as long as we don't know that we're in one. As soon as we know that we're in one, he or she might lose interest and turn the whole thing off. So, by talking about this, you might be endangering your own existence. In fact, the existence of the entire universe could be at stake.

Suggested Reading

Bostrom, "Are You Living in a Computer Simulation?"

Johnson, "Metaphysics."

Questions to Consider

1. If we live in a computer simulation, would you travel to the outside world if you had the opportunity? What would you say to our simulation's creator? Could you be sure that you weren't just in another simulation? What should the creator of our simulation conclude about whether or not he or she is in a simulation?

2. How comfortable are you with sacrificing certainty and knowledge for wisdom and understanding? Do you find yourself wanting to ascribe to a particular metaphysical view, or are you comfortable just saying, "I don't know"?

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